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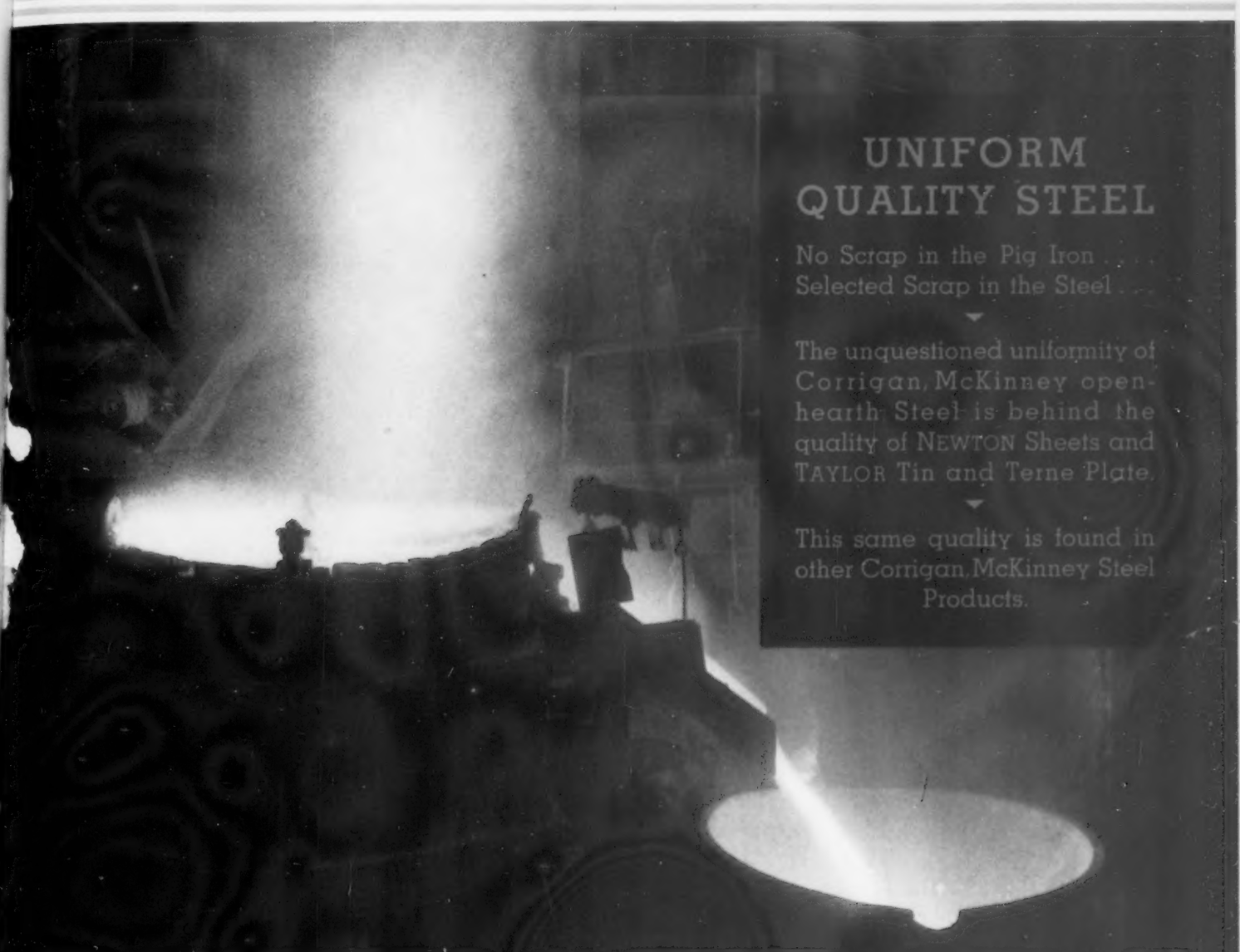
For forty-eight years—IRON TRADE REVIEW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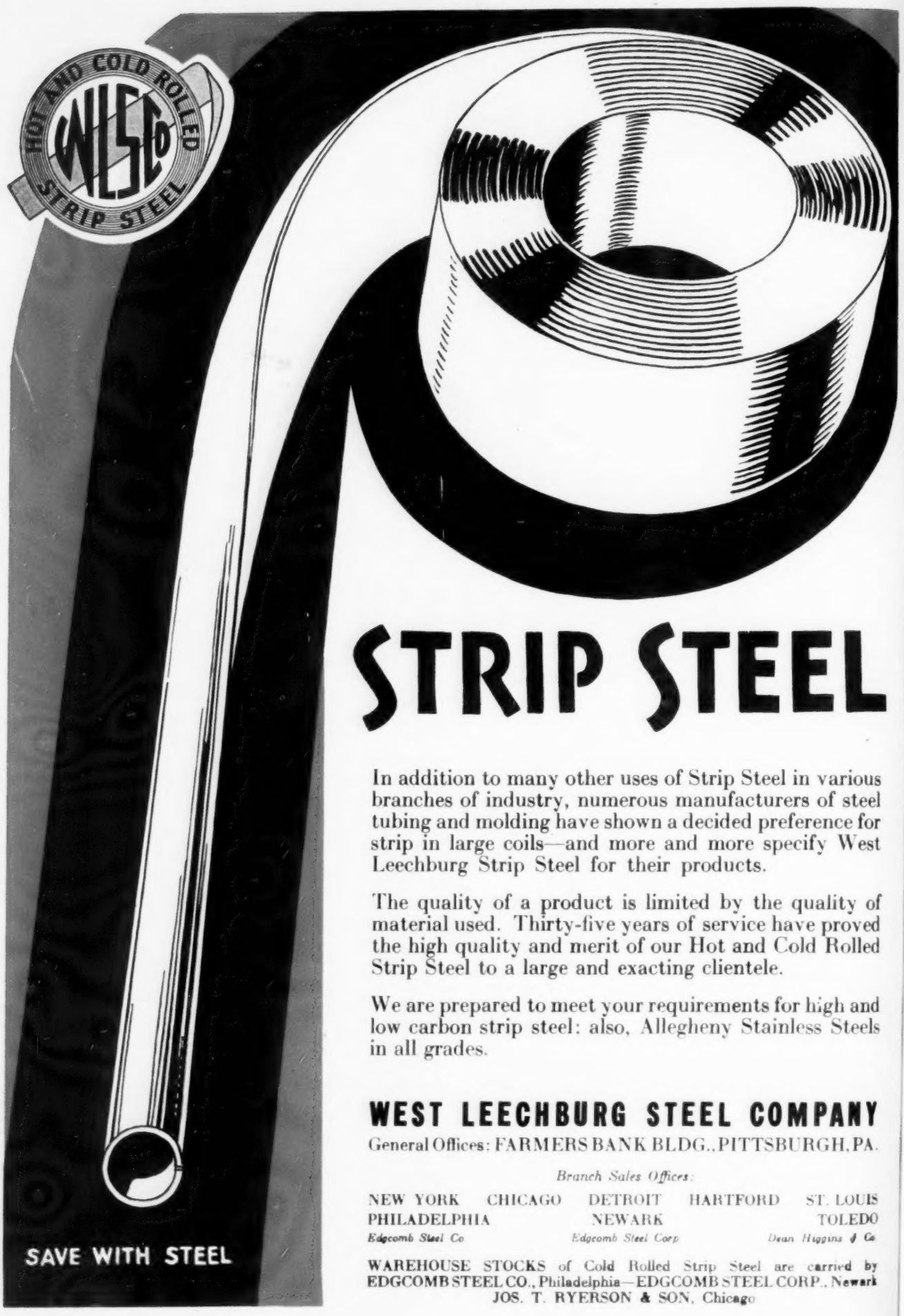

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Volume 91 Number 23

STEEL

For forty-eight Years—IRON TRADE REVIEW

PRODUCTION • PROCESSING • DISTRIBUTION • USE

The Week in Perspective

WHEN the ancient worthy observed that "the fathers have eaten sour grapes and the children's teeth are set on edge" he unwittingly but accurately described the situation which is plaguing industry today. To profitable operations in 1932 a principal barrier is the heritage from the cycle which ended in 1929. In the case of steel, this heritage is obsolete plant which should have been abandoned and charged to surplus, with a share perhaps borne by consumers whose more exacting requirements induced obsolescence, one authority maintains (p. 11). Of modern, effective capacity there is no disturbing surplus, he contends. Probably more than one executive has referred to his excess capacity in more vigorous language than "sour grapes."

Auto Stockholders' Teeth Will Be on Edge

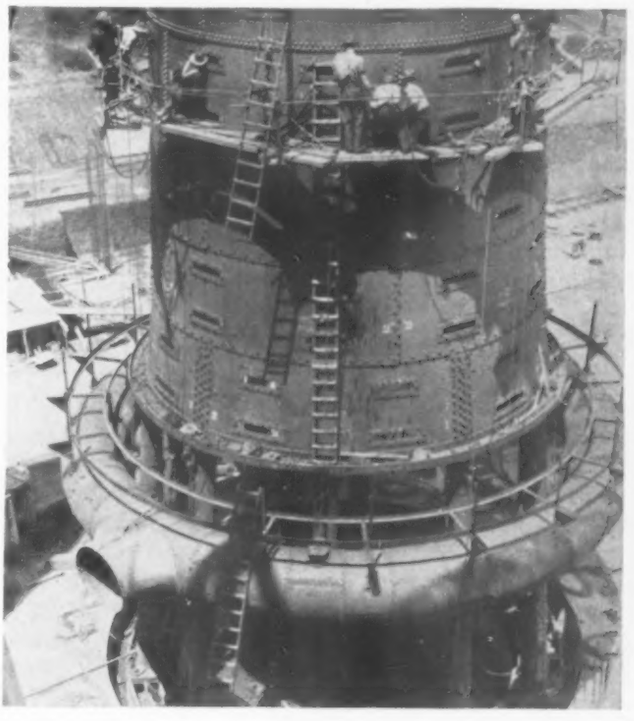
In the automobile industry there is frank confession that the overbuilding of 1929 was extravagance for which stockholders must pay. More than one manufacturer is understood to be figuring costs on 1933 models, now beginning to roll off assembly lines, on the basis of actual plant utilized (p. 15). Thus, unit costs are reduced, greater values can be offered to stimulate buying, the acres of idle manufacing space are a deadweight on the balance sheet instead of on new cars. Meanwhile, with characteristic courage, the automobile industry is investing nearly $25,000,000 in new dies and retooling for new models. Chevrolet, whose new line will be out Dec. 17, is passing Plymouth and again leading production.

Pig Iron Gain Almost Stops; Steel Rate Off

Tempering a further decline in steelmaking to 16 per cent (p. 49), a surrender of all the improvement in October and November, is the showing of blast furnaces last month. By the extremely narrow margin of 60 tons did daily production of pig iron exceed the October average (p. 13), registering the third consecutive monthly gain. . . . A moderate increase in pig iron output in Canada in October (p. 14) was the first since March. . . . A slightly easier domestic market situation contrasts with a more mixed market in Europe (p. 55). Italy is buying pig iron; Midlands trade is dull; Scottish mills have more inquiry for export; the Continent finds export trade quieter.

Way of Importer Is Made Harder

While London is attempting to relate foreign trade to war debts, Washington is disposed to make importation of foreign steel a little more difficult. Paint, the customs bureau has ruled (p. 14), does not permanently identify imports, as die stamping or rolling do. . . . New York is adamant on its embargo on foreign



This 500-ton blast furnace at Pretoria, South Africa, will be completed soon by Ashmore, Benson, Pease & Co. Ltd., British associates of the Freyn Engineering Co., Chicago

steel for municipal work (p. 17), refusing the petition of importers to lift it. . . . In the Pacific Northwest alien steel is being offered at $10 to $12 per ton below domestic (p. 55), but low demand and local patriotism co-operate to narrow buying. . . . In the eastern markets more pig iron is being received from abroad (p. 51), 5000 tons of a cargo of over 6000 tons going to a Delaware river pipemaker. . . . Some eastern gas and utilities are inquiring (p. 48) for their early 1933 requirements of cast pipe.

Firebrick Yields Stubbornly Before Heat

At the high temperatures encountered in open-hearth steel furnaces the thermal expansion of firebrick is about 1/16-inch per foot, or one third that of silica, magnesite or chrome brick (p. 29). In a 4-foot back wall an enlargement of ¼-inch is not disturbing, but an increment of ¾-inch in other materials may cause an appreciable movement of the roof or set up severe stresses in the buckstays. Firebrick thus is favored for back walls . . . . A recently-developed refractory cement, of which fire clay is the base, has merit (p. 35) for closing joints in the refractory lining of steel mill reheating furnaces, thus avoiding early failure.

Improved Application Widens Use of Zinc

Zinc die castings are finding increased favor, due partly to improved casting practice and development of new alloys which show considerably higher physical properties, notably impact and tensile strengths and freedom from dimensional changes (p. 21). Thin-wall sections have proved a great advantage . . . . Cold-rolled strip, after being coated with a flux and either powdered zinc or copper, is subjected to approximately 2000 degrees Fahr., the coating penetrating the pores of the steel and being removable only by abrasion (p. 35). Zinc is applied more effectively at a slightly lower temperature than copper.

General, but Useful to the Engineer:

A new hydraulic pump dredge for excavating sand and gravel aggregates is all-steel (p. 24), manganese steel being used for the digging ladder and pump parts, where wear is greatest . . . . Authoritative data on feeds and speeds at which machines should be operated in cutting various metals with different types of tools will be included in a forthcoming handbook (p. 23), calculated to increase efficiency of machining operations . . . . Railroads are considering using (p. 33) chromium-manganese-silicon steel for lightening the weight of their cars . . . . "Tungum" is a nickel-copper-silicon alloy (p. 35), resistant to acid corrosion and sea water, but with physical properties of mild steel.

The VOICE of INDUSTRY

Communications appearing here do not necessarily reflect the opinion of STEEL *or of its editors.*

Who Will Pay International Debts?

To the Editor:

Can the present international debts be paid under existing conditions? European nations already have agreed that Germany could not pay the reparations demanded and have agreed to a very large reduction. Can we obtain full payment? It is possible we can, but we shall also pay in full ourselves.

By exacting payment we depress foreign credit and make it more profitable for us to import. And the harder we make it for the foreigner to pay, the lower goes his standard of living and the harder we are hit by imports.

Whether we like it or not, we shall pay the debt ourselves. The laws of international trade cannot be abrogated. Only political expediency keeps us from canceling.

S. H. D.

Chicago.

Believes Factory-Built House Impracticable*

To the Editor:

In connection with some of the steel houses described in your pages recently, I cannot imagine myself working up any enthusiasm over living in a cold appearing steel house after all these years of admiration of some of the present day creations of warm brick and wood.

A house which meets every desire of one family fails to satisfy any of another. To my mind the whole scheme is wrong. The greatest satisfaction in owning a house is the knowledge that you have created a shelter which peculiarly is yours. It represents your ideals of the way you yourself should like to live. Unless it is that sort of a place there is no joy in owning or living in it. An apartment would serve just as well, or perhaps an automobile.

If this be true then I fail to see how a house can be constructed in a factory or even fabricated in a factory. If it is a creation at all it must be built just as we build them now—piece by piece on the ground, according to the fancies of the owners.

MANUFACTURER

Illinois.

Are Manufactured Articles Too Good?

To the Editor:

Is it not possible that one of the factors contributing to the business depression is the improved quality and durability of many manufactured products? There are numerous articles such as shoes, tires, typewriters, washing machines, floor coverings, kitchen utensils, etc., which because of better materials and improved construction, last much longer than the corresponding articles available two or three decades ago.

This argument may seem fantastic, but I believe that many of us, who think we are intelligent manufacturers, are putting more durability into our products than is required, and in doing so we are throttling the replacement market.

PARTS MAKER

Ohio

*A number of letters expressing opinions almost diametrically opposed to those held by "Manufacturer" have been received and will be published as soon as possible—THE EDITORS.

Profits in the Steel Industry—III—A Sound Prescription

By EDMUND NEWTON

THE difficulty with measuring profits by the ratio of surplus net profits to net worth is that it is based upon an estimated amount for surplus net profits, and also an estimated value for assets represented by net worth. Both of these are affected by the depreciation policy.

Profit is the balance of price remaining after the deduction of manufacturing costs and the expenses of doing business. One of these items of expense is depreciation. Regardless of the method by which the amount of depreciation is arrived at, it is but an estimate. As a result, what is termed surplus net profit is but an estimate.

Depreciation not only affects the earnings statement for any single year, but the reserve for depreciation affects the amount of net plant and equipment, which in turn is reflected in net worth. This latter effect is cumulative. While differences in the depreciation policy may be scarcely noticeable in any one year, over a period of 10 or 20 years their cumulative effect is apparent. Unconservative depreciation policies have exactly the same effect upon a business as unwise capital expenditures. They result in building-up a larger fixed property investment than should be required to conduct a given volume of business, and place added fixed expense and financial burdens upon it.

Whether or not the amount set aside for depreciation is adequate, depends upon the nature of the industry and also upon the entire policies of renewals, replacements and betterments, and these vary widely. Sloan* makes the following striking statement, as the result of the initial study by the Standard Statistics Co. of 545 concerns in 1926 and 1927:

"The most interesting fact about the depreciation policy of American industry is that there is none."

In order to better interpret the comparison of profits of various industries in the period from 1927 to 1930, a more detailed analysis of the Standard Statistics Co. data has been made in Table V, and is shown graphically in Fig. 4.

An inspection of the average figures for each industry group indicates that 40 industries have ratios for depreciation to sales closely approximating 2 per cent. All but one of these 40 industries may be classed as non-extractive, while the remaining 10 are largely extractive industries. The 50 industries have, therefor, been classified into main groups on the basis of this difference in the ratio of depreciation to sales. The industries of both main groups have been arranged in order of the ratio of depreciation to plant and equipment. The 40 industries have been grouped into classes extending between certain indicated percentage limits of this ratio. The 10 industries are shown individually.

From a study of these data, it is evident that the amount set aside annually for depreciation by the 40 industries is well within what may be termed "their ability to pay;" that plant and equipment represents a lesser percentage of their total assets, and a relatively small percentage of sales yields an ample amount of depreciation for the requirements of their plants. Under these conditions, it is relatively easy for them to set aside a proper, or even a too large, amount to provide for the actual decrease in the value of their plants, due to the economic or functional factor of obsolescence as well as for physical wear.

This is not the case with the 10 industries with their low turnover

*Laurence H. Sloan, "Corporation Profits," Harper & Bros., 1929, page 41.

TABLE V

Depreciation and Depletion in Various Industries—1927-1930

Based on weighted averages for the four years

Class or Industry	Number of Industries	Per Cent of Assets	Million Dollars Total Assets—Average	Depreciation Per Cent of Plant	Depreciation Per Cent of Sales	Turnover on Plant	Plant Per Cent of Total Assets	Surplus Net Profits—Per Cent of—Sales	Net Worth	Plant	Depreciation Per Cent of Net Earnings Before Depreciation
Depreciation and depletion on plant and equipment											
Plus 10 per cent.....	2	1.34	438.51	12.89	2.25	5.730	17.10	10.69	13.29	61.30	10.68
Plus 8-10 per cent.....	6	12.34	4,039.53	8.51	2.94	2.895	38.00	9.44	14.22	27.30	20.35
Plus 6- 8 per cent.....	10	9.24	3,032.07	7.29	1.79	4.070	35.60	7.65	13.40	31.20	16.65
Plus 5- 6 per cent.....	8	11.05	3,621.15	5.71	1.95	2.935	33.80	9.92	11.41	29.10	12.30
Plus 4- 5 per cent.....	4	6.15	2,019.62	4.43	1.88	2.359	49.50	8.78	12.40	20.70	16.78
Plus 3- 4 per cent.....	7	9.19	3,017.86	3.47	0.75	4.651	38.75	2.81	6.80	13.09	15.68
Minus 3 per cent.....	3	3.49	1,146.44	2.26	1.54	1.463	57.20	8.77	9.28	12.84	12.18
Sub-total and average	40	52.80	17,315.18	5.80	1.81	3.210	38.90	7.40	11.62	23.75	16.30
Low turnover industries											
Oil—production and refin.	1	24.56	8,052.08	11.00	7.48	1.470	57.50	6.79	7.27	9.98	51.00
Mining—lead and zinc.....	1	0.52	171.45	7.74	13.65	0.566	67.00	25.40	10.81	14.35	32.25
Shipping and shipbuilding..	1	0.49	161.36	7.33	7.60	0.965	56.90	5.44	4.21	5.25	31.20
Building—asphalt	1	0.74	241.73	5.53	7.48	0.740	66.30	12.50	7.62	9.25	37.40
Ice and refrigeration.....	1	0.31	100.55	4.25	6.96	0.610	74.55	18.45	10.21	11.21	27.50
Steel	**1**	**12.90**	**4,245.13**	**3.58**	**4.26**	**0.840**	**66.80**	**9.16**	**6.60**	**7.70**	**31.60**
Mining—copper	1	4.56	1,500.71	3.23	5.49	0.589	65.20	18.75	8.69	11.02	22.65
Sugar—production and refining	1	1.52	499.12	3.15	4.79	0.658	53.10	9.22	4.29	6.08	32.45
Mining—coal	1	1.47	482.70	2.80	4.40	0.637	69.40	1.57	0.98	1.00	73.00
Building ownership	1	0.13	44.04	1.11	5.70	0.195	78.00	34.45	16.10	6.72	13.60
Sub-total and average	10	47.20	15,498.87	7.16	6.52	1.100	61.40	8.17	7.04	9.00	43.25
Grand Total and Average....	50	100.00	32,814.05	6.66	3.38	1.970	49.50	7.67	9.46	15.01	28.20

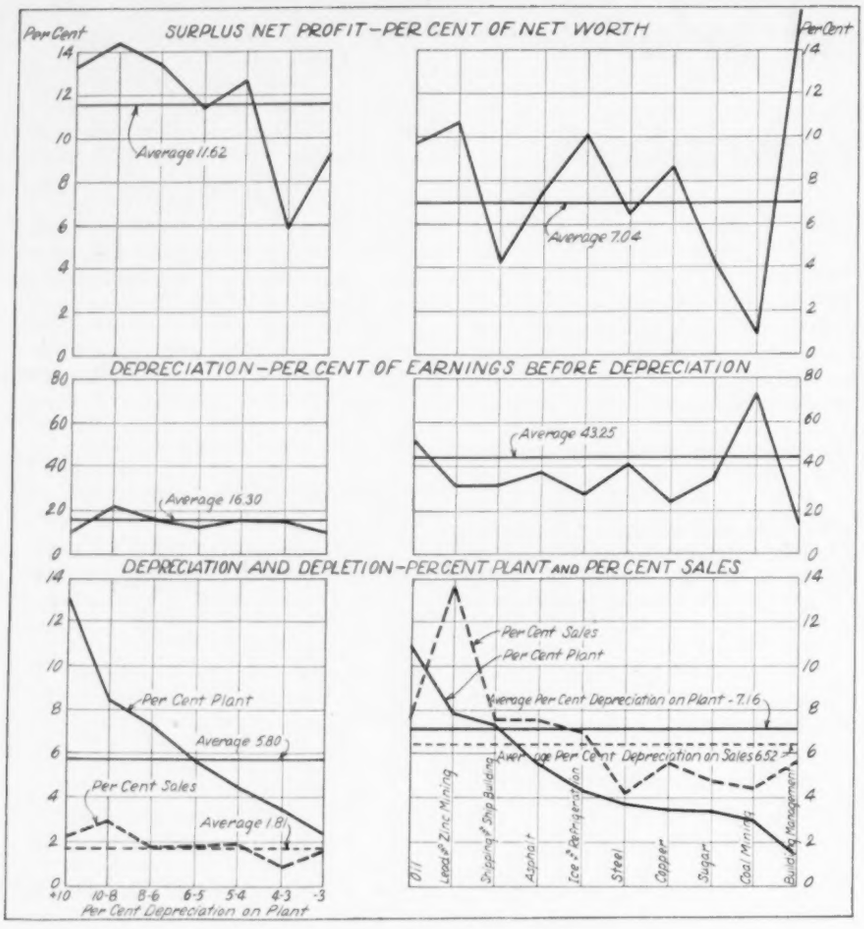


Fig. 4—Analysis of depreciation and depletion

on plant. By setting aside a percentage of their earnings, before deducting depreciation, nearly three times as large, they depreciate their plant and equipment at only about the same rate as the 40 industries, and their surplus net profit when related to net worth is only about two-thirds that of the 40 industries. Consequently, it is a real hardship for these 10 industries to set aside a proper amount for the actual plant requirements, and in many cases this may not be done.

These data raise the point as to whether or not the steel industry has included, in the amount set aside in the years past, a sufficient provision for the *fact* of obsolescence.

By the very nature of the complexity of manufacturing operations necessary to produce the great variety of steel products demanded, and the low unit value of steel products, a relatively large amount of capital must be invested in plant and equipment in order to produce a dollar of sales. Coupled with this fact has been the very general policy of vertical integration, extending operations back through all stages of manufacture, transportation of and production of raw materials. Each of these steps has required large investments, either in reserves of raw materials or in various types of plant and equipment.

Granting that these characteristics are more or less inherent to the effective production of steel, it is pertinent to ask to what extent these large investments in physical property—large not only in the actual aggregate amount but also large in relation to the amount of sales produced—are used.

The average annual estimated ingot capacity of the United States since the war has been approximately 57,868,000 tons, while the average annual production of ingots has been about 39,500,000 tons. The available estimated ingot capacity, therefore, has been used at an average rate of only 68.4 per cent. Granting that the fluctuations of demand throughout business cycles and the increase of average annual requirements make it necessary to have a certain margin between available capacity and average production, the question rises: Is there too much margin?

There is a great deal of talk of excess capacity. Since the war, the steel industry has shown in its operating results all the symptoms of excess capacity. Heavy property expense burdens have required the exertion of every effort to maintain physical volume over which to distribute this burden. This has resulted in keen competition, and unintelligent price-cutting has decreased the margin of profit between price and production costs. As this margin has decreased, property expenses have become more burdensome and finally the return on net worth has been decreased. Assuming that these characteristics of the steel industry since the war have been largely the result of excess-capacity, it is of interest to inquire as to just what sort of plants make up this excess capacity.

On the broad assumption that the capacity actually used is presumably that which will function most effectively and at lowest cost, it must also be assumed that, in general, this capacity used is represented by the most modern plants. While geographic location also is a factor as well as age, the probability is that the more recently built plants are located more favorably, with respect to both the balance between low-cost assembly of raw materials and the proximity to the market. Some analysis of the age of the ingot capacity of this country may be of interest.

Curves Based on New Capacity

In order to serve this purpose, Fig. 5 has been constructed. The curves are based upon the summary of new ingot capacity completed in each year as published by *Iron Trade Review* and its successor STEEL. Before 1913, the amount of new construction is from estimated capacity figures published every three years by the American Iron and Steel association. To the increment between reports, there has been added 5.0 per cent to represent capacity probably abandoned during the period. This figure has been determined from 1913 to 1931 to be 4.04 per cent.

From Fig. 5, it is evident that the weighted average age of the 66,069,000 tons of estimated annual ingot capacity of the United States in 1931 was nearly 22 years, and that the oldest one-third of this ingot capacity was about 33 years old.

While this estimate of the age of ingot capacity is but an approximation, and while ingot capacity does not exactly reflect finishing mill capacity in point of age, it opens up interesting vistas for thought. Since many of these older plants were located and built, events of tremendous economic importance have taken place. Great changes have occurred not only in the technology of steel manufacture, but in the types of steel demanded. Entire new industries have sprung-up and have called for steel with new and exacting specifications. Other uses have declined, or have not increased as rapidly as total production. There has been a shifting in the location of markets. Railway transportation rates have increased and have placed

a greater burden, not only upon the cost of assembling raw materials but also they have altered the competitive position of certain plants with respect to markets. About one-fourth of the 1931 ingot capacity was built during the war, or was projected because of war demand. This capacity was built hurriedly, at high costs, with probably little thought given to location for effective use after the war.

With these facts in mind, the conclusion seems inevitable that there is no real excess capacity of reasonably modern, effective plants; that the presence of obsolete plants in the total has led to the belief that there is such excess capacity, with all its undesirable symptoms; that the present rate of building new capacity has not been too rapid, but rather that the rate of abandonment of geographically and technologically obsolete capacity has been too slow.

How To Remedy Condition?

Whatever the causes of this condition may be, the most important job at present, is to work toward its correction. The obvious initial action which would seem to be called for, would be to abandon the more obsolete capacity and to write-down the plant and equipment account to surplus.

As an example that there is ample surplus available for this purpose, the composite plant and equipment account of the 11 steel companies at the close of 1931 amounted to

(*Please turn to Page 57*)

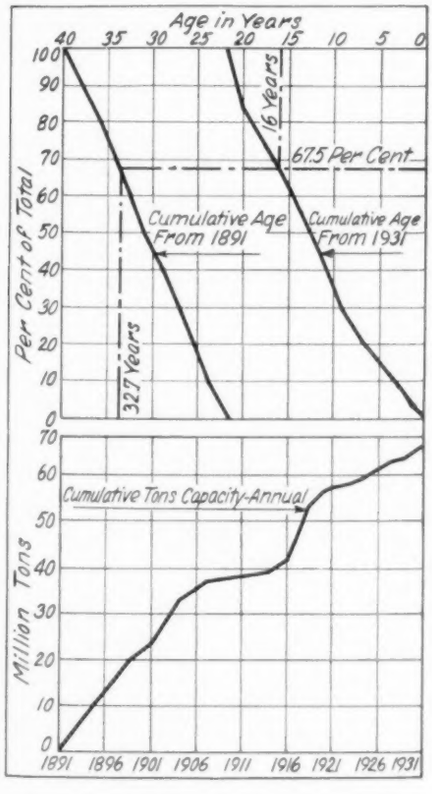

Age in Years
40 35 30 25 20 15 10 5 0
16 Years
67.5 Per Cent
Cumulative Age From 1891
Cumulative Age From 1931
32.7 Years
Per Cent of Total
Cumulative Tons Capacity-Annual
Million Tons
1891 1896 1901 1906 1911 1916 1921 1926 1931

Fig. 5—Estimated age of ingot capacity

Gain in November Iron Output Small: One More Stack In

AVERAGE daily production of coke pig iron in November exceeded the output of October by only 60 tons, although four furnaces were added to the active list in October and one more in November. But by this narrow margin, daily production and stack activities showed improvement over three consecutive months for the only time this year, in fact, the first time since early in 1931.

Active furnaces totaled 51 on the last day of November, a figure which was the highest since May 31 when 54 were operating. The figure for Oct. 31 was 50, and 46 for Sept. 30. The low point for all time was 41 on Aug. 31.

Average daily production in November was 20,855 gross tons, this being only 60 tons, or 0.29 per cent, better than the 20,795 tons of October. Output almost equaled the 20,867-ton level of June. In November, 1931, iron was produced at the rate of 36,727 tons per day.

Total production for November was 625,663 gross tons, which, compared with the 644,648 tons of the preceding month, was a loss of 18,985 tons, or 2.94 per cent. November was a one-day shorter month than October. In October, one year ago, the output was 1,101,820 tons. For the 11 months of 1932, production has aggregated only 8,126,798 tons, compared with 17,282,634 tons in the corresponding period of 1931.

Relating production to capacity, the operating rate for November was 14.7 per cent, the same as for October. The figure for September was 14.0 per cent, and for November, one year ago, 25.5 per cent.

During November, three furnaces were blown in and two blown out or banked. Nonmerchant or steelworks stacks gained two and lost one and merchant stacks gained one and lost one.

Furnaces blown in during the month were: In Ohio: Jisco, Jackson Iron & Steel Co. In Pennsylvania: Cambria H, Bethlehem Steel Co.; and one Swede, Alan Wood Steel Co.

Furnaces blown out or banked were: In Pennsylvania: One Monessen, Pittsburgh Steel Co. In New York: Buffalo No. 4, National Steel Corp.

AVERAGE DAILY PIG IRON PRODUCTION

	1932	1931	1930	1929
Jan.	31,336	55,337	91,573	110,742
Feb.	33,122	61,114	101,640	114,942
Mar.	31,194	65,448	104,930	119,622
Apr.	28,524	66,986	106,371	122,106
May	25,282	64,355	104,564	125,753
June	20,867	54,599	97,817	123,837
July	18,394	47,170	85,110	122,016
Aug.	17,035	41,264	81,455	120,845
Sept.	19,788	38,947	75,893	116,548
Oct.	20,795	37,831	69,851	115,747
Nov.	20,855	36,727	62,182	106,081
Dec.	.....	31,625	53,732	91,513
Av.	24,259	50,035	86,141	115,808

RATE OF BLAST FURNACE OPERATION

(Relation of Production to Capacity)

	1932[1]	1931[2]	1930[3]	1929[4]
January	22.1	38.4	65.0	79.0
February	23.4	42.5	72.1	82.2
March	22.0	45.4	74.5	85.5
April	20.2	46.5	75.4	87.4
May	17.9	44.7	74.2	89.8
June	14.7	37.9	69.3	88.5
July	13.0	32.7	60.3	87.2
August	12.0	28.7	57.8	86.4
September	14.0	27.0	53.8	83.3
October	14.7	26.3	49.6	82.6
November	14.7	25.5	44.1	75.8
December	.....	22.0	38.1	65.5

[1]Based on capacity of 51,598,175 gross tons Dec. 31, 1931; [2]on capacity of 52,515,875 tons; [3]on capacity of 51,490,680 tons; [4]on capacity of 51,069,895 tons. Capacities by American Iron and Steel institute.

MONTHLY PIG IRON PRODUCTION

	1932	1931	1930
Jan.	971,437	1,715,443	2,838,751
Feb.	960,550	1,711,192	2,845,937
Mar.	967,015	2,028,906	3,252,822
April	855,734	2,009,582	3,191,119
May	783,769	1,995,001	3,241,477
June	626,015	1,637,998	2,934,508
July	570,222	1,462,270	2,638,441
Aug.	528,105	1,279,205	2,525,105
Sept.	593,640	1,168,436	2,276,781
Oct.	644,648	1,172,781	2,165,374
Nov.	625,663	1,101,820	1,865,458
11 mos.	8,126,798	17,282,634	29,775,773
Dec.	.....	980,377	1,665,715
Total	.....	18,263,011	31,441,488

NOVEMBER IRON PRODUCTION

	No. in blast last day of month		Total tonnage made	
	Nov.	Oct.	Merchant	Nonmerchant
Ohio	16	15	32,943	175,351
Penna.	15	14	15,423	140,430
Alabama	5	5	43,648	8,108
Illinois	4	4	21,658	26,242
New York	2	3	13,307	29,496
Colorado	0	0		
Indiana	4	4		
Maryland	2	2	266	80,370
Virginia	0	0		
Kentucky	1	1		
Mass.	0	0		
Tennessee	0	0		
Utah	1	1		
West Va.	1	1	.....	28,273
Michigan	0	0		
Minnesota	0	0		
Missouri	0	0		
Ferro and spiegel—all states	....	....	.....	10,148
Total	51	50	127,245	498,418

Require Lasting Mark on Alien Steel; I.C.C. Backs Bridge; News of Washington

WASHINGTON—Paint does not qualify as a permanent marking of the country of origin on imported steel, and the customs bureau of the treasury department has ruled that proper marking requires rolling the identification into the steel or the use of die stamping in legible and distinct English words in a conspicuous place.

This ruling has been made specifically on angles, including those under 3 inches, but it is stated that the application is general to all iron and steel imports.

In the court of customs and patent appeals, steel angles have been adjudged dutiable at 1/5 cent per pound as building material. Angles were assessed at 3/10 cent per pound as steel not especially provided for, in the case of an importer who protested and urged the 1/5 cent duty, which is sustained.

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Interstate commerce commission, Dec. 1, approved the loan application of New Orleans for $6,000,000 from the Reconstruction Finance Corp. for financing in part the proposed Belt Line railroad bridge across the Mississippi river, at New Orleans, requiring about 65,000 tons of steel.

The R. F. C. is to purchase $52,500 of bonds of Columbia, Ill., for a waterworks project requiring 500 tons of cast iron pipe, and $10,000 from Blackstone, Va., for a water works system requiring 1400 feet of 6-inch pipe.

R. F. C. loans in October total $170,000,000, of which $81,514,500 was for self-liquidating loans. Chicago & North Western railroad received $21,461,350, the Erie $6,170,000 and the Baltimore & Ohio and Lehigh Valley each $3,000,000.

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Efforts of blast furnace interests, principally in the North and including the Alan Wood Steel Co., Bethlehem Steel Co., Hudson Valley Fuel Corp., United States Pipe & Foundry Co., Alabama Iron and Steel Shippers Conference and others, to knock out reduced rates on pig iron from Birmingham, Ala., and related points in the South to Gulf ports, South Atlantic ports and Norfolk, Va., for coastwise movement beyond, have failed.

Interstate commerce commission said it lacks authority to prescribe minimum rates on pig iron from southern producing points, moving under joint rates over joint rail-water or rail-water-rail routes via Norfolk and other southern and Gulf ports to North Atlantic ports, or beyond to inland destinations, except on traffic moving over the Central of Georgia railway to Savannah, Ga., and the Ocean Steamship Co., of Savannah, beyond.

It is also stated by the commission that "prescription of minimum joint rail-water or joint rail-water-rail rates on pig iron from Birmingham and related southern producing points to north Atlantic ports, or to inland destinations in the north, via the Ocean Steamship Co. from Savannah, found not warranted."

The commission found further also that the "joint rail-water rates and joint rail-water-rail rates from Birmingham and related southern producing points to destinations in trunk line and New England territories were not shown to be unduly prejudicial."

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Proposed reductions in carload rates on cast iron pipe from Ohio and northwestern Pennsylvania regions to destinations in Central Freight association territory have been found not justified by the interstate commerce commission and the schedules ordered cancelled. Southern producers of cast pipe opposed the reduced rates.

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Railroads have applied to the interstate commerce commission under the fourth section to restore the so-called Jones & Laughlin short-haul mileage scale on iron and steel products in Illinois Freight association territory. The railroads propose to reduce existing rates, and on certain hauls charge less than to intermediate points, for one reason to meet truck competition.

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A drawback granted to the Bethlehem Steel Co. on ferromanganese manufactured with the use of imported manganese ore and on fabricated steel manufactured by its subsidiary, the McClintic-Marshall Corp., has been amended to provide a drawback on fabricated steel manufactured by McClintic-Marshall on the basis of the minimum quantity of 80 per cent ferromanganese used in the manufacture of the net weight of steel appearing in the exported articles.

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Bureau of labor statistics says the number of plants which have adopted the 5-day week has more than doubled during the past year.

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On Dec. 7 the ways and means committee of the house will get to work on the question of taxation and balancing the budget according to Representative Collier, Democrat, of Mississippi.

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Tariff commission has "denied and dismissed without prejudice" the application for a decrease in the duty on ferruginous manganese ore filed Dec. 11, 1931, by William W. Hearne Inc., of Philadelphia.

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Refund for overassessment of income and profits taxes amounting to approximately $22,000 has been made to the Colonial Iron Co., Riddlesburg, Pa., by the bureau of internal revenue for 1917-1921.

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The German cartel for square wire netting has been reorganized under temporary agreements, say reports to the department of commerce.

Pig Iron Output in Canada In First Gain Since March

Pig iron output in Canada in October at 6751 tons was 15 per cent over the 5709 tons of September and registered the first gain since March. The October total was entirely basic. Output of ferroalloys in October was 1599 tons, compared with 732 tons in September.

Production of steel ingots and direct steel castings in October at 17,102 tons was 26 per cent below the 23,139 tons of September. The 10-month total of ingots and castings in Canada is 274,945 tons, against 625,781 tons in the like period of 1931.

To Fight for Short Week

Organized labor will campaign for the universal adoption in industry of the 5-day week and 6-hour day, resorting to "forceful methods" if necessary to gain its objective, William Green, president of the American Federation of Labor, declared at last week's convention of the federation in Cincinnati. Maintenance of present wage rates in conjunction with the 30-hour week will be demanded. The federation plans to have the federal government set the example by adopting the shorter week.

Hausman & Wimmer Operate

Hausman & Wimmer Co., Pittsburgh, iron and steel scrap dealer, Pittsburgh, continues to operate pending court action Dec. 9 following an equity receivership. The company is closing its New York and Detroit offices.

MIRRORS OF MOTORDOM

DETROIT

NOT many industries are gambling $20,000,000 to $25,000,000 on a new product at this time, but automobile manufacturers have the courage to do it. For jigs, dies, fixtures, retooling and other adjustments necessitated by the new 1933 models their outlays probably mount to this estimate. Materials are not included.

Mechanical changes are below the average in volume and cost. Plymouth has superseded its four with a six; Willys is bringing out a new four and six; Continental is to offer a four in the extreme low-price field; Lincoln has two new twelves coming; Franklin has introduced a low-price six; a new sixteen is in the Marmon line; Nash has developed a low-price eight; Essex probably will replace its pacemaker six with an eight; Ford and Auburn have programs as yet undisclosed.

As an offset, body changes are above the average, due principally to the trend toward streamlining. Probably no individual adjunct of production is so costly as a set of body dies.

Typical of the expense thus entailed is the matter of dies for the new style of front doors—the slanting front line which not only affords more toe room but also conforms in most cars to the rake of the windshield, the hood louvres or doors and radiator shell. A manufacturer of a line of sixes and eights estimates the cost of a set of door dies, even after making as many doors as possible interchangeable on both lines, at nearly $150,000. Recently it cost another manufacturer $30,000 for new dies to effect only minor changes in fenders.

This expenditure of $20,000,000 to $25,000,000 will be spread over 1,700,000 to 1,800,000 passenger cars, if the consensus of present opinion on the 1933 market proves accurate, the average per car being about $12.50.

In more prosperous days, manufacturers of passenger cars selling below $1000—and they represented a large majority—aimed at a net profit of approximately $80 per unit. Hopes for any profit in 1933 are dim, but in adjusting costs to make possible lower retail prices, many manufacturers have reduced what might be called the normal margin to about $50.

More than one automobile manufacturer is understood to be using a new base for costs for 1933 models. Only plant and equipment actually required for production are taken into consideration; idle plant and surplus equipment are being treated specially, in some cases being charged to surplus.

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Plymouth, first of 1933 models to be introduced, has yielded the spotlight to Buick, presented Dec. 3, and to the Dodge six, shown Dec. 5. On Dec. 17 the new Chevrolet will be out. Pontiac is scheduled for display about Christmas time, and most other new models will be held back for the New York show.

It was understood that one of the objectives of Fisher Body in 1933 was to differentiate the various General Motor lines, but many body improvements are cutting across the entire line. Superficially, the new Chevrolet will greatly resemble the Buick. It too will have fender valances, front and rear, to mask the undergear, and will have the divided windows, one part raising and lowering and the other pivoting, to provide individual ventilation. Front windows on all models will be thus divided, and the rear windows on some models. The new Chevrolet will be about 1 inch longer and 300 pounds heavier.

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Plymouth scales the peak of enterprise by engaging a radio chain to herald "the country's No. 1 car," Chevrolet on a thousand billboards advises "follow the leader," Henry Ford goes to the hospital with a bad-order appendix and hernia and garners page one publicity that money cannot buy.

Detroit, always envious but secretly an admirer of Mr. Ford's personal publicity, regards it as just another fortunate break that, if Mr. Ford had to be afflicted, it should occur just prior to a change in his models.

What Walter P. Chrysler and William S. Knudsen would give for such internal co-operation that, in the case of Mr. Ford, elicited long distance telephone calls from King George and Mussolini and cablegrams from the Prince of Wales and von Hindenburg, all of which has been duly recorded in hundreds of newspapers entirely free to the Ford organization!

Because Mr. Ford's word is the supreme court, presumably the Ford program is being somewhat delayed. Those with the closest contacts with the Ford organization are most loath to speculate. But Detroit continues divided into two camps. As recently related, one group believes that Ford will return to his first love—concentration on a low-price car. The other group is convinced that in addition to a low price car, most generally believed to be a straight eight, there will also be a larger eight, probably a refinement of the present eight.

Enough preliminary work has been done to put a low-price Ford four, six or eight on the market in January, and on some parts for an improvement of the present eight bids are known to be in. For one thing, there has been definite figuring on a new type of shock absorber and for semielliptic instead of transverse springs on the large eight. Experiments by Ford on a cast steel crankshaft and connecting rods, probably for a low price eight, are said to be progressing, with adoption a possibility.

Over the record low output of 48,934 passenger cars and trucks in the United States in October, as reported by the department of commerce, No-

(*Please turn to Page* 48)

Industrial Men in the Day's News

Thomas W. Pangborn, Vice President, National Founders' Association

FOR 35 years he has been identified with the foundry supply industry and actively interested in the foundry.

HE has been president and is a director of the Foundry Equipment Manufacturers' association, and has been a director of the A. F. A.

IN his home city of Hagerstown, Md., he has an enviable record as an adjuster of a disturbed banking situation.

THOMAS W. PANGBORN, elected vice president of the National Founders' association at its convention in New York, Nov. 17, brings to his new post a wide background of experience in general business matters as well as an intensive first-hand knowledge of the foundry and its allied supply industry.

Born in Brooklyn, N. Y., in 1880, he spent his early childhood in Minnesota, returning to New York at the age of 17 when he received his first experience in foundry and rolling mill activity. In 1900 he became salesman for Hendricks Bros., New York, dealers in metals, and continued with them until 1904, when he founded his own company, the Pangborn Corp., at Hagerstown, Md., of which he continues to be president.

Typical of his interest in his community, when two of the seven banks in Hagerstown closed last year Mr. Pangborn was drafted to take charge of the principal bank and a short time later was elected president of the Clearing House association to co-ordinate the activities of the five remaining banks. For the restoration of confidence that ensued, Mr. Pangborn personally was largely responsible.

Mr. Pangborn is a past president and now a director of the Foundry Equipment Manufacturers' association; is a director of the Equitable Trust Co. and the Maryland-Virginia Joint Stock Land bank, both of Baltimore; state director of the Liberty Mutual Insurance Co., Boston; president of the Washington County Manufacturers' association, Hagerstown, and during the war was county director of the Maryland State Fuel Administration.

In addition to his membership and interest in the National Founders' association, the American Foundrymen's association of which he was a director 1923-26, and the Foundry Equipment Manufacturers' association, he is a member of the American Society of Mechanical Engineers.

WESLEY G. NICHOLS, president of the American Manganese Steel Co., Chicago Heights, Ill., has retired, following a long and varied career in the steel business. In 1885 he entered the employ of the Glasgow Iron Works, Pottstown, Pa., and three years later joined the Chester Rolling Mill Co., Chester, Pa. In 1896, only a few years after manganese steel was first made in the United States, he was employed by the Taylor Iron & Steel Co., High Bridge, N. J.

When in 1905 the American Brake Shoe & Foundry Co. undertook the manufacture of manganese steel at Chicago Heights, Mr. Nichols organized the operating end and has seen it grow until there are eight foundries in the United States and Canada. Mr. Nichols continued in direct charge of operations for 15 years and shortly after the Edgar Allen American Manganese Steel Co. was organized in 1910, to handle the manganese steel business, he was elected vice president. In 1915 the company became the American Manganese Steel Co. and in 1920 he was elected president.

W. E. Crocombe, who is also president of the American Forge Co., succeeds Mr. Nichols as president of the American Manganese Steel Co.

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Merril G. Baker, formerly vice president of the Vanadium Corp. of America and recently assistant to the vice president of Ford, Bacon & Davis Inc., engineers, New York, has been elected president of the Union Steel Casting Co., Pittsburgh.

Jan R. Dunsford has been elected chairman of the board of the Union Steel Casting Co.

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Henry J. Davis, general superintendent of the Clairton steelworks and furnaces as well as the Clairton by-products coke works of the Carnegie Steel Co., will retire Jan. 1 after 43 years of continuous service, announcement of the resignation being made last week. Mr. Davis began work at 13, and in 1889, as a machinist at the Edgar Thomson works of the Carnegie company. The next year he was transferred to the Homestead works as a machinist, finally

becoming master mechanic, and in 1905 assistant general superintendent. He assumed the general superintendency of the Clairton works in that year, and under his direction the by-products coke plant and affiliated units were later constructed. No successor to Mr. Davis has been named yet.

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K. H. Lovell, recently identified with the American System of Reinforcing, Chicago, has joined the reinforcing bar department of the Inland Steel Co., Chicago.

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W. D. Thomas, president, Sandvik Steel Inc., New York, has been knighted by the King of Sweden in recognition of his services in promoting trade between the United States and Sweden. The formal decoration will be made on Mr. Thomas' visit to Sweden in January.

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A. H. Gfrorer, formerly chief engineer of the Automatic Transportation Co., is now associated with the Easton Car & Construction Co., Easton, Pa., as consulting engineer in charge of electric truck design. This company about a year ago acquired the electric truck division of the Lakewood Engineering Co., Cleveland.

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Douglass Millard, manager of fuel sales of the Colorado Fuel & Iron Co., Denver and Pueblo, Colo., has been appointed manager of by-product sales of the company, by Arthur Roeder, president. By-products, including fly sprays, disinfectants and pest controls, have been developed by coke plant chemists working with G. A. Sabin, in charge of advertising for the company.

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Edward F. Ledwidge has been appointed general traffic manager of the Granite City Steel Co., Granite City, Ill., to succeed the late Ross A. Blanchard. From 1905 to 1908 Mr. Ledwidge was with various railroads, in July, 1908, becoming traffic manager for the Walsh Fire Clay Products Co., St. Louis, a position he held until Jan. 1, 1928. At that time he became a consulting traffic manager.

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J. N. Fleming has retired as purchasing agent of the American Steel & Wire Co., Cleveland, after 46 years of continuous service, under the retirement provisions of the United States Steel Corp.

F. E. Chesney has been appointed purchasing agent with offices in Cleveland, and D. C. MacDonald has been named assistant purchasing agen with headquarters in Worcester, Mass.

Install Blooming Mill Motor

USSR chamber of commerce reports that the blooming mill of the steelworks at Magnitogorsk is nearing completion and the installation of the 7000-horsepower main motor has begun.

Obituaries

CUYLER ADAMS, 80, who discovered the Cuyuna iron range in Minnesota and built the Cuyuna Iron Range railroad, died Nov. 29, at his winter home at Tryon, N. C.

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William F. Huff, 56, president and general manager of the Wabash Foundry Co., Wabash, Ind., died recently.

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Timothy J. Welch, 75, for several years associated with the South Rolling Mills, died at Terre Haute, Ind., Nov. 11.

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Stephen S. Tuthill, 63, first secretary of the American Zinc institute and recently in the real estate business, died at Brooklyn, N. Y., Dec. 1.

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Ray P. Johnson, 54, president of the Warner Gear Co., Muncie, Ind., and vice president of the Borg-Warner Corp., died at Phoenix, Ariz., Nov. 16.

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John Crerar, 75, founder of the Crerar, Clinch Coal Co., Chicago, and for ten years identified with the Joliet Steel Co., Joliet, Ill., died Nov. 30 at Lake Forest, Ill.

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Frank E. Hinners, 72, president of the George H. Smith Steel Casting Co., Milwaukee, and identified with the company for the past 30 years, died Nov. 22. He had been president since 1912.

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Samuel Moore, 57, connected with Crane Co., Chicago, died at Chicago recently. He formerly was identified with the American Radiator Co., Whiting Corp. and National Radiator Co.

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Arno Eberlein, 70, secretary-treasurer of the Buckeye Steel Castings Co., Columbus, O., died Nov. 16. He became an employe of the Buckeye company in 1890 and 14 years later was made secretary-treasurer.

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Charles A. Wolff, 94, until his retirement 20 years ago a manufacturer of stoves in Cincinnati, died Nov. 10. One son, Charles F. Wolff, is secretary of the Wolff Machine Co., and another, Louis A. Wolff, is head of the Wolff Supply Co.

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John D. Paton, 70, son of James Paton, said to have built the first blast furnace in Cleveland, died at Cleveland, Nov. 29. He was employed 52 years ago by the Cleveland Rolling Mill Co. and later with his father formed the Crescent Tin Mill Co. He helped organize the Empire Rolling Mill Co. and was superintendent when he retired 12 years ago.

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Alfred Schneider, 68, president and treasurer of the Twin City Machine Co., Minneapolis, died Nov. 15. In 1890 he became superintendent of the Twin City Iron Works and ten years later joined with O. P. Briggs in forming the Twin City Machine Co.

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Thomas J. Caldwell, 73, pioneer foundryman in the Birmingham, Ala., district died the past week. He began an industrial career as bookkeeper for the Shelby Iron Co. in Alabama in 1859, and opened his first machine shop in 1896. His son will continue the Caldwell Foundry & Machine Co.

New York Keeps Ban on Foreign Steel in City Jobs

New York board of estimate has decided to stand by its resolution of Nov. 4 prohibiting the use of foreign steel in all city contracts, following a hearing sought by the National Council of Importers and Traders.

Importers maintained that New York as a world port could not afford to discriminate against foreign material.

Thomas F. Doherty, traffic counsel of the American Iron and Steel institute, contended that the increased use of domestic steel would provide employment that would be generally beneficial.

Steel & Wire Co. To Close Steelworks at Cleveland

In 1933 the American Steel & Wire Co. will abandon its Newburgh steelworks in Cleveland, where seven open-hearth furnaces and two bessemer converters have an annual capacity of 800,000 tons. It is assumed that the Central furnace plant in Cleveland, with four stacks, and the coke works will then be required no longer. The Cuyahoga, Consolidated and American plants and Newburg wire works will be unaffected by this change. Billets will be brought from the National Tube Co. at Lorain, O., presumably by water during the season of navigation.

Canal Traffic Is Halved

Movement of iron and steel on the New York state barge canal during the 1932 season, just ended, totaled 93,820 tons, against 199,268 tons in 1931. Reduction in the movement of pig iron and billets was even more pronounced, 1932 shipments being 19,585 tons, compared with 70,515 tons in 1931.

EDITORIAL

Unemployment Cannot Be Cured by Theory

UNEMPLOYMENT is one of the most serious problems confronted by the nation today. Putting men to work is essential to business recovery, and no one realizes that fact more clearly than the employers of labor in industry. To their great credit it can be said that they are striving harder in the present emergency to stimulate employment than they have done in any previous crisis.

There are two distinct parts of the unemployment problem. The first involves the millions of idle workers whose loss of jobs is due to the depression. Their plight is bound up so inextricably with many factors, including prices of commodities and securities, debts and credit, etc., that this phase of unemployment is an integral part of the great overall problem of depression. Recognizing this fact, and realizing that the progress of recovery will be slow in nearby months, industry has introduced temporary measures in an attempt to hold unemployment in check until aid from other directions can be mustered. Chief among these palliatives are the share-work plans and the rehabilitiation movements in industry.

Industry's Duty Two-fold: Whip Depression, Then Attack Technological Unemployment

The second part of the problem concerns the century-old situation, which, in the period since the war, has been called "technological unemployment." Everyone familiar with employment statistics knows that from 1921 to 1929, the number of workers per unit of output decreased in many of the manufacturing industries. From this fact, it is concluded that if business could be restored to 1929 levels tomorrow, there still would be a large number of workers without jobs in manufacturing plants.

Today industry's clear-cut duty is, first, to continue to do everything it can to help restore industrial recovery and thereby increase employment, and second, to work toward a solution of the long-time problem of technological unemployment.

Unfortunately for those whose duty it is to cope with this last-named problem, the public now is being deluged with a shower of misleading information that will cause confusion, without contributing constructively to a solution. A group of engineers, parading under the banner of "Technocracy" and using as one of its mediums for expression the *New Outlook*, edited by the eminent Alfred E. Smith, pretends to have discovered facts which place at the door of technological progress blame for all the shortcomings of our present civilization.

Examples of Destruction of Jobs by Machinery Are Exaggerated

The chief fallacy in the reasoning of these engineer-economists is that they ascribe to industry feats of efficiency that have not been accomplished. They distort the picture of automaticity beyond the limits of reason. They say that the A. O. Smith Corp. at Milwaukee turns out 10,000 automobile frames and 34 miles of pipe daily "with a total of 208 men in the plant." They write: "A photograph of a modern steel rolling mill in full operation will show a large plant without a human being on the floor"; as if to advise the reader that rolling mills require no labor beyond the men who manipulate the controls. They say that in incandescent lamp manufacture, one man today does in one hour as much as it took him 9000 hours to do in 1914. On the basis of this statement, the General Electric Co. would have required 44,000,000 employes for its 1914 lamp output!

From such absurdities, Wayne W. Parrish, writing in the *New Outlook*, arrives at this arresting conclusion: "It is after sober, scientific review of such facts that our engineers report that we are faced with the threat of national bankruptcy and perhaps general chaos within 18 months." He characterizes the share-work program as "sterile of all logic or sense," and our present economic system as fit only for a museum of antiques.

The technocrats are working on more data to apply to their "theory of energy determinents," (which they admit is more complex than that of Einstein's unified field theory), and in due time they may be expected to produce a "cure" for the curse of technology.

In the meantime, industrial employers, who have more at stake than the theorists and who are the ones upon whom the responsibility for practical action rests, will continue in their efforts. We believe public interest will be benefitted more by the courage and ability of enlightened management than by the magic of spectacular theories possessed of Einsteinian complexity.

THE BUSINESS TREND

Employment Gains Exceed Seasonal Expectation

BUSINESS recovery is so closely allied with improvement in the employment situation that the gain of 2.4 per cent in employment in the manufacturing industries in October, as reported by the United States bureau of labor statistics, is encouraging.

Records over a number of years show that the normal seasonal trend of employment involves gains in the months of August and September and a gradual recession through October, November and December to a low point in January. The comparison of actual indices of the bureau for recent months of 1932 with the seasonal trend (normal month=100) follows:

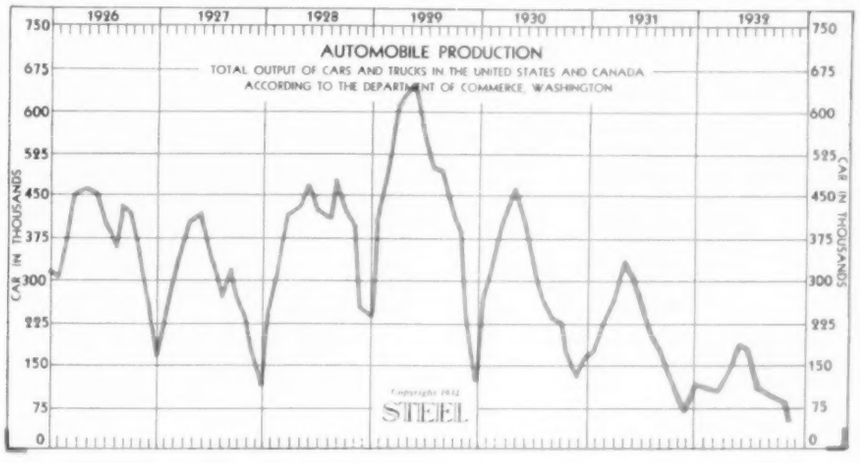
	Actual, 1932	Per cent Change	Seasonal Trend	Per cent Change
July	55.2	.....	98.8	.....
August	56.0	+1.5	100.3	+1.5
September	58.5	+4.5	102.5	+2.2
October	59.9	+2.5	101.8	—0.7
November	.....	.....	100.0	—1.8
December	.....	.....	99.0	—1.0

From this comparison it is evident that employment gains in September and October were appreciably more than normal. It also is clear that if the rate of employment from now on through the winter does not decline in excess of the seasonal trend, the number of workers on jobs will fluctuate within a very narrow range.

The federal reserve board's index of industrial production for October stood at 66—the same as in September. This figure confirms what was indicated in part by earlier statistics of industrial activity, namely that the momentum of business noticeable in September and early October had spent itself before the end of the tenth month. Nevertheless the gain in the index during the late summer and early fall was the most impressive improvement noted since the rise from January to March in 1931.

Weekly Statistics Show Industry Is Strongly Resisting Seasonal Pressure

Production of soft coal in the week ending Nov. 19 exceeded that of the corresponding week of 1931. This is a rare occurrence in 1932 business statistics. Revenue freight car loadings in the week ending Nov. 19 increased 38,758 cars to 575,851. This compares with 653,503 in the corresponding week of 1931 and represents the first time in 1932 that the margin of deficiency from 1931 figures has been cut to below 100,000 cars.

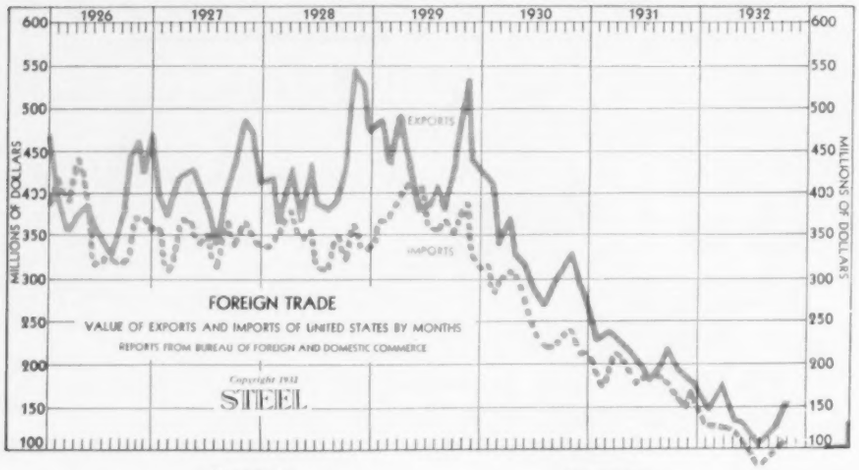


1932

Oct.	51,857
Sept.	86,483
Aug.	94,483
July	111,141

1931

Oct.	81,564
Sept.	143,222
Aug.	191,741
July	222,710



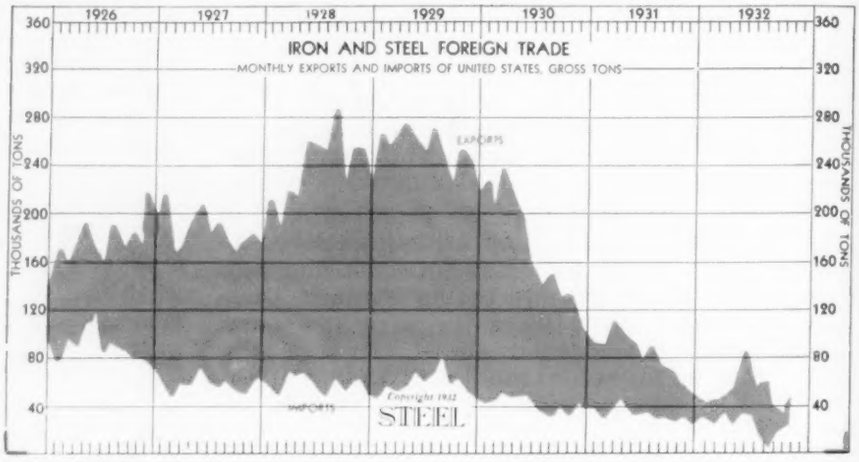
Exports		Imports	
Oct., 1932	$153,000,000	Oct., 1932	$106,000,000
Sept., 1932	132,025,000	Sept., 1932	98,412,000
Oct., 1931	204,905,000	Oct., 1931	168,708,000

Foreign Trade Balance Up As Exports Advance

With October export valuation totaling $153,000,000 this country's foreign merchandise trade continues to show moderate signs of improvement. Exports in September totaled $132,025,000 and in October last year merchandise leaving this country aggregated $204,905,000. According to the report from the bureau of foreign and domestic commerce, the valuation of imports is provisionally computed at $106,000,000 for the current month, leaving a favorable trade balance for October of $47,000,000.

Iron and Steel Export Trade Expands in October

Exports of iron and steel products, in October, made the second consecutive monthly increase according to figures compiled by the iron and steel division of the department of commerce. Exports gained from 36,038 tons in September to 41,226 tons in October. Export trade during October last year aggregated 59,335 tons. Imports for the current month totaled 33,693 tons, a gain of 4,452 tons over the previous month. Scrap shipments, totaling 10,004 tons, were largely responsible for the expansion in export trade.

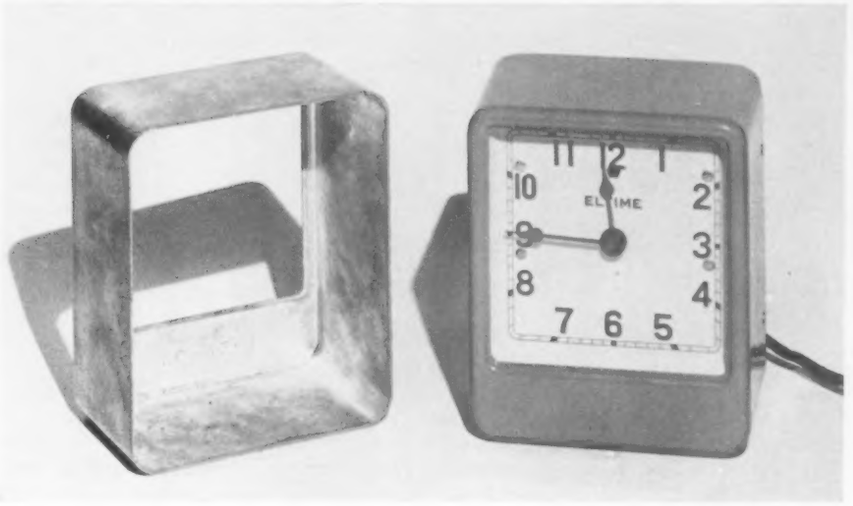


Exports	Tons	Imports	Tons
Oct., 1932	41,226	Oct., 1932	33,693
Sept., 1932	36,038	Sept., 1932	29,241
Oct., 1931	59,335	Oct., 1931	29,401

October, 1932	66
September, 1932	66
October, 1931	73

Industrial Production Is Unchanged in October

After increasing considerably during August and September, the index of industrial production as compiled by the Federal Reserve board remained unchanged at 66 in October. Among the component parts of the index manufacturers declined one point to 64. Employment in most manufacturing industries increased during the early part of October and the seasonally adjusted index of factory employment gained from 60.3 to 61.1. In the manufacturing group, iron and steel gained three points to 31.



DEVELOPMENT of thin-wall section die castings has opened up a large field for clock cases, instrument cases and switch and transformer cases. The case of this inexpensive electric clock has a wall thickness of only 0.035 inch

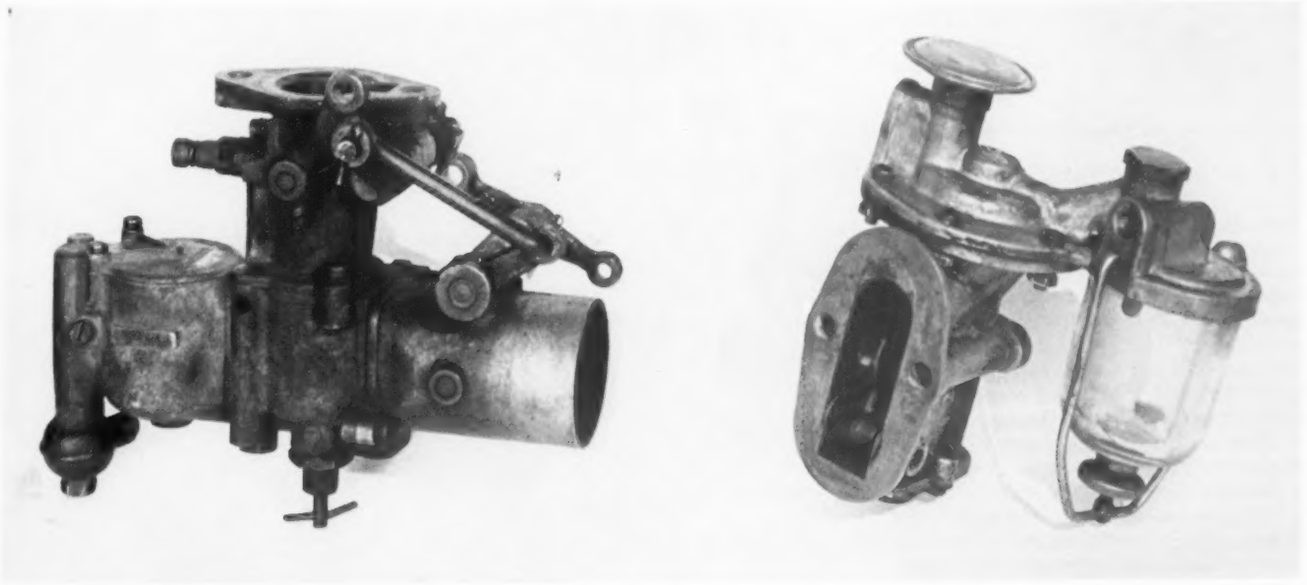
NEW ALLOYS AND IMPROVED TECHNIQUE EXTEND USE OF ZINC DIE CASTINGS

NEW production methods are developing rapidly in many fields, simplifying design, materially decreasing machine and assembly costs, and in numerous cases improving quality and appearance of the product. While zinc die castings have been achieving these ends actively in some industries for a comparatively long period of time, they have been increasingly effective in the past few years.

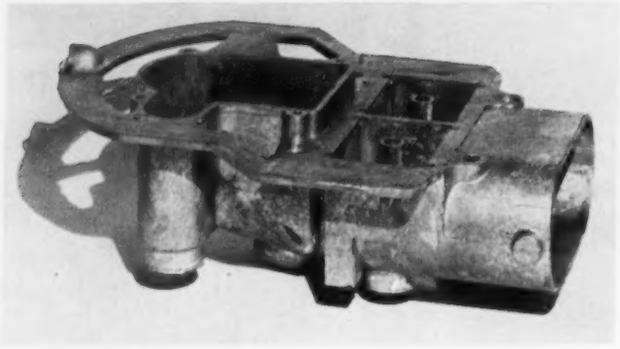
Comparatively few people yet realize the improvements made recently in zinc die castings through the adoption of improved casting methods and new zinc alloys. Production managers and engineers who are informed of these improvements, however, are taking full advantage of their qualities and are improving their product materially at a lower production cost.

Once a designer is fully aware of the possibilities inherent in this process, he invariably finds many new and interesting ways to adapt zinc die castings to his product. A casual examination of the number of applications of zinc die castings which have given satisfactory service in the past, and which still are being manufactured by this process, is a worth-while way to measure the true value of this production method.

Furthermore a survey of the new applica-



Zinc die cast carburetor at the left has been in service over 55,000 miles and the fuel pump at the right has been used for over 50,000 miles. Both still are in good condition



A DOUBLE-JET carburetor bowl in the as-cast condition, showing the gating and sprue

tions, both in the industries which have used die castings in the past and those just adopting them, is interesting. The steady increase in the number of die castings being used by industries long interested in their application as a means of effecting economies in design, finish and assembly is a true valid indication of the increased satisfaction manufacturers are now receiving from zinc die castings.

The automobile industry is one of the first to present itself as a long-time user of zinc die castings. Carbureters, fuel pumps and wind shield wipers have been assembled largely of die castings for a good many years. One of the accompanying illustrations shows a carbureter and a fuel pump, die cast of zinc alloys, which have been in service over 55,000 and 50,000 miles, respectively. Another shows a rough die casting of the double-jet type of carbureter bowl now used on many of the larger, fine cars in the United States.

The satisfaction given by die cast automotive hardware is most effectively shown by the increasing number of pieces added every year. Two of the smaller, more popular automobiles have more zinc die castings on their new models than on any previous one. The more expensive motor vehicles are embellished with plated die castings of exquisite design.

New Applications Developed

Recently automotive design has turned toward narrow radiator moldings, which in several instances have been produced with interesting die castings. In the case of at least one high-grade car, the cowl ventilator hood is a zinc die casting. Automobile horn projectors developed recently are said to have demonstrated the remarkable acoustic properties of zinc die castings.

This continued and increased enthusiasm for die castings, however, is not confined to the automotive industry. In the field of business machines, check protectors were among the first in which die castings were introduced. The various parts for these devices were eminently suited to this manufacturing process. One of these machines—17 years old and still in good operating condition—is reproduced in another of the illustrations. A recently designed electrically-operated check protector of the same manufacture contains 18 zinc die castings. Profiting by this experience, manufacturers of many other business machines have incorporated die cast housings, gears, levers and brackets in their products.

As in the case of the check protector, the precision of detail obtained by the die casting process suggested zinc as the material from which to make the automatic valve wheel illustrated. The die and production cost of 100 of these zinc die-cast wheels was less than the calibration cost alone on 100 of the wheels these displaced.

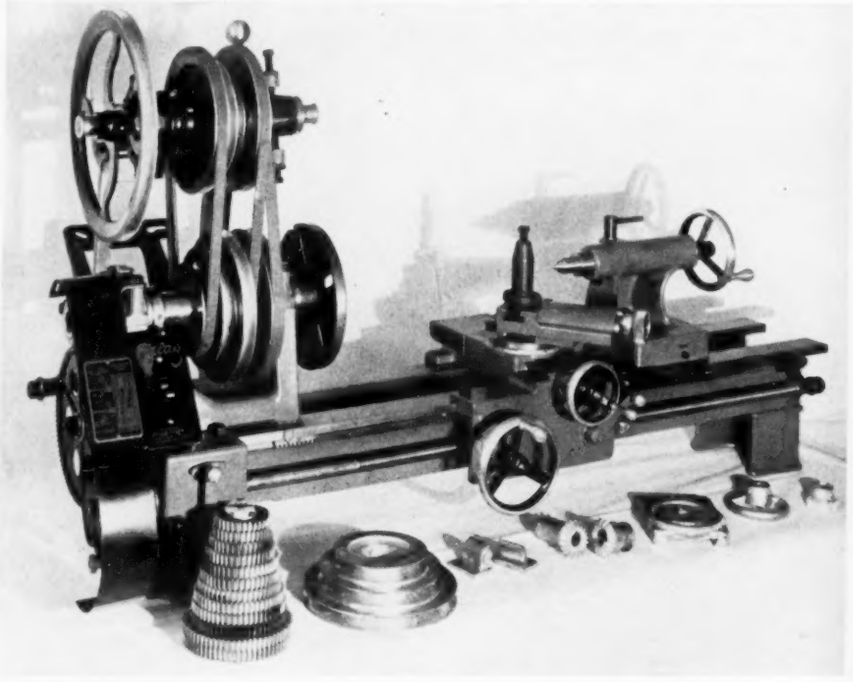
Die castings usually are considered solely for quantity production, but an application such as this calibrated wheel suggests other applications where such castings would either greatly improve the quality or lower the cost of an article not in quantity production.

The improved physical properties of zinc die casting alloys now on the market have opened up new possibilities. Not only have higher tensile and impact values been achieved, but their permanence is now assured. Dimensional change in a casting is now reduced to a commercial minimum—that caused by the formation of surface corrosion products—a change to which all metals, not totally resistant to oxidation, are subject.

Impact strength, or the resistance to a sudden blow, is probably the most important property of die castings in the great majority of applications. This property has been improved greatly in alloys made available only in the past few months by the New Jersey Zinc Co., New York. Measured according to American Society for Testing Materials procedure on a standard ¼-inch square test bar, this value has been increased to between 15 and 20 foot-pounds. Tensile strength likewise has been increased in some instances to as high as 50,000 pounds per square inch.

Improvements Widen Field

Due to these improved physical properties and accompanying improvements in casting qualities, many zinc die castings have been made which previously had been deemed impossible. To mention only one, there is the electric clock case reproduced in one of the accompanying illustrations. The case has a wall thickness of 0.035-inch. This electric clock retails at $1, and as can readily



This moderately priced, 9-inch, screw-cutting, bench lathe has 46 of its parts made from zinc die castings. Among them are the handwheels, drive pulleys, gears and micrometer collar on the crossfeed screw

be imagined, production has been large.

Not only has the development of thin-wall sections opened up the large field of clock cases, but that of instrument cases, switch and transformer cases as well. These castings claim as their advantages the incorporation of lugs, ribs, bosses, and other structural features.

46 Lathe Parts Die Cast

A new, moderately-priced, 9-inch screw-cutting bench lathe, of which 46 parts are zinc die castings, is shown on the preceding page. Manufactured by the Atlas Press Co., Kalamazoo, Mich., it is intended for the small workshop, repair shop or home, or the experimental laboratory, maintenance department or toolroom of any industrial plant.

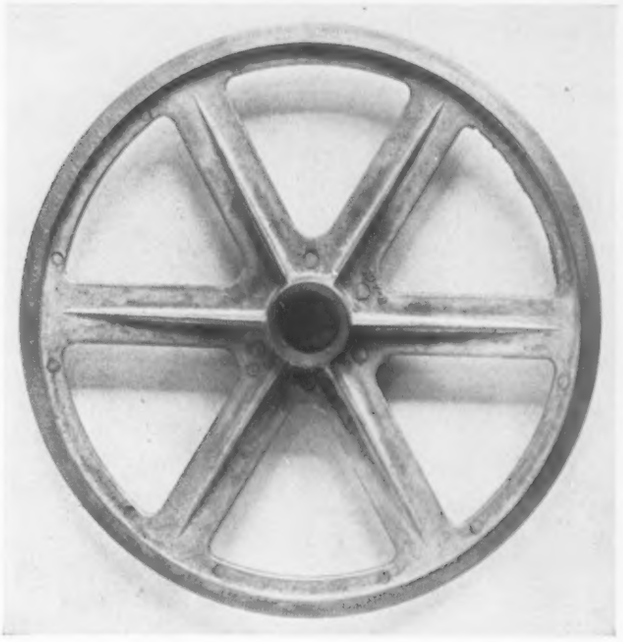
To produce such a lathe at the moderate price desired, it was necessary to use great care in selecting the materials and designing the parts. Zinc die casting was decided upon after considerable experimenting and testing. The handwheels, drive pulleys and gears all are die cast and have proved to be strong and durable. Much of the economy has been effected by the die casting of such calibrated parts as the micrometer collar on the crossfeed screw.

This lathe is pointed out as an indication of how zinc die castings can be used economically in the manufacture of machine tools, and undoubtedly it is a forerunner of innumerable applications of zinc die castings in this field.

During the past year a manufacturer of 1-ton and 2-ton hoists has converted several more parts to manufacture by die casting. At present, 75 per cent of the weight of these hoists are in zinc die castings. Many parts in textile machinery now are die cast of zinc. One moving picture projector which is used in almost all of the houses operated by one of the large chains contains about 50 die cast zinc parts.

This year has seen a pronounced increase in the interest shown by manufacturers of plumbing and builders' hardware toward zinc die castings. Door locks and stops, window hardware and many other fixtures, are being offered in die cast designs.

In 1932, as was the case last year, business conditions are reflected in the ingenuity of design of parts and improved mechanics of the die casting process. Development of the wider use of these castings is expected to register materially in the tonnage column when industrial activity assumes more normal proportions.



DIE casting this automatic oil well valve wheel saves the cost of calibrating wheels made by other methods

THIS check protector, utilizing zinc die castings in its construction, remains in good condition after 17 years' service. A modern electrically-operated machine of the same manufacture contains 18 die castings

Plan Handbooks To Provide Metal Cutting Data

If a super "speed boss," possessing and imparting all existing practical knowledge of cutting metals, might visit all the machine shops of this country and assist the men running them in bringing their metal cutting practice up to what could be achieved by their machinery and high-speed tools, it would be worth millions of dollars to the industry. A research committee of the American Society of Mechanical Engineers is proposing to provide for such a "boss," through the medium of handbooks to be published and sold by the society. These handbooks would make readily available to shop superintendents, foremen, rate-setters, machinists, etc., authoritative data with respect to feeds and speeds at which machines should be operated in cutting each type and grade of metal with each type of commonly used cutting tool.

This project is to be undertaken by a subcommittee of the society's special research committee on cutting of metals, and is the outgrowth of a suggestion made several years ago by King Hathaway, consulting management engineer, Manning, Maxwell and Moore, New York.

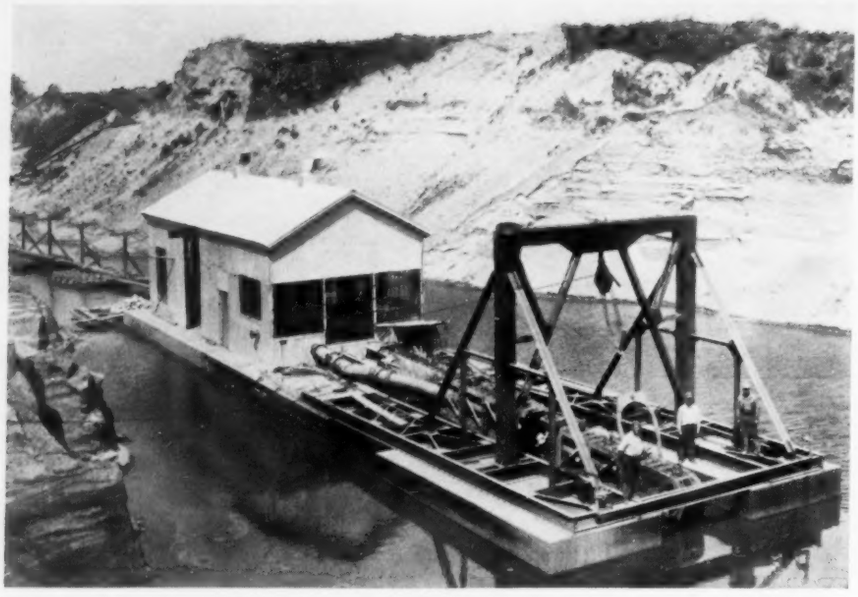


Fig. 1—General details of the all-steel construction of the pump dredge are shown in this view of the equipment, ready for operation, with the agitator ladder raised

Hydraulic Dredge of Steel Embodies New Features

ALL-STEEL construction is a distinctive feature of a new hydraulic pump dredge for the excavation of sand and gravel aggregates, recently placed in operation by the Koenig Coal & Supply Co., Detroit. In addition to the all-steel feature, design of the dredge is unique in that the owners desired construction that would involve a minimum of assembly time, all parts so planned that they could be assembled by local plant crews, a minimum of freight shipping expense, and a semiportable construction that would permit ready disassembly, moving and reassembly. Furthermore a digging ladder of proper length for the immediate deposit depths to be worked was required, with provision for adding suitable ladder lengths for future greater deposit depths of excavation, with the structure supporting the ladder of sufficient strength to accommodate two ladder lengths.

Engineers Plan Design

Engineers of the pump department of the American Manganese Steel Co., Chicago, created the design of the dredge in its entirety, supervised its construction and cooperated with the owners in specification selection of all equipment. General design comprises a main hull with a forward well recess for the digging ladder, and two outrigger forward pontoons mounting their fixed A-frame structure, joined to the main hull with a set of four stringer members using pinned connections.

Viewed from the deck position the construction shows a fully enclosed framed-type ladder well. The hinged pontoons are used to give sufficient freedom of connection or articulation to allow for varying ladder bail pull loads and to dispense with under overall dredge boat bobbing movement stresses resulting from intense wave actions set up when heavy bank cave-ins occur. Fig. 1 shows the dredge in position for operation with the ladder in the above-water raised position.

The main hull portion is built with four individual pontoon units of water-tight plate steel tank construction. These units were assembled using heavy diaphragms of special plate and angle construction. The two aft pontoons are each 33 feet long by 12 feet wide by 4 feet 6 inches deep, of simple rectangular box shape with square corner construction. The two forward pontoons are of similar dimensions except that the inner forward ends of each are recessed, forming the hull ladder well. Spacing between the pontoons for diaphragm width is 2 feet.

Ample Bracing Provided

In completed assembly the overall size of the deck is a rectangle 68 feet long, 26 feet wide, with deduction for the ladder well opening, placed in the middle of the fore and aft centerline. Each pontoon unit is amply provided with both thwartship and fore and aft internal structural bracing. All joints and seams are double gun shop riveted and all outer plate edges of seams are calked. Each pontoon is provided with suitable size of round manhole and bolted-type cover. All interior surfaces are coated with asphaltum paint applied hot.

Exterior side faces of the pontoons for diaphragm connection are provided with heavy angles riveted in

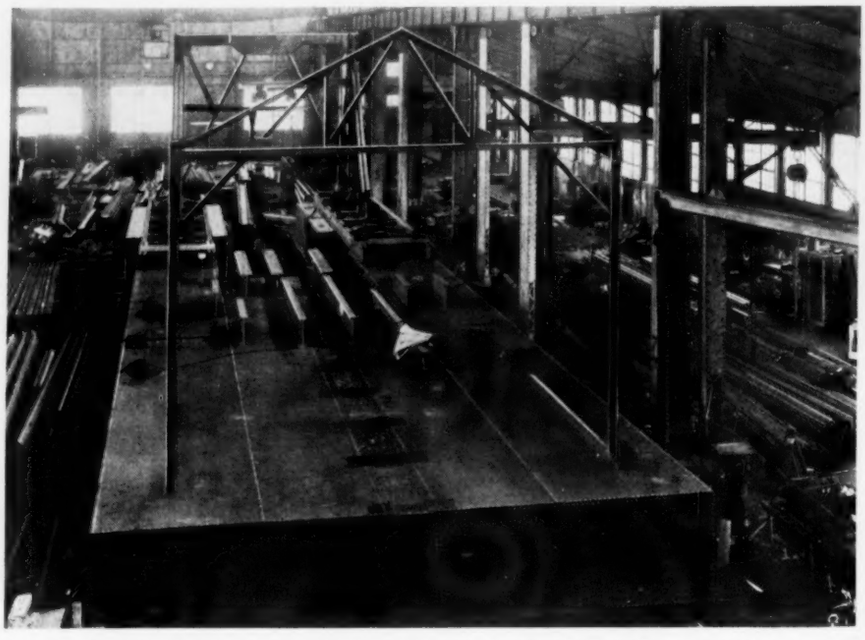


Fig. 2—Details of the completed assembly of the entire boat construction in the structural steel shop preliminary to shipment

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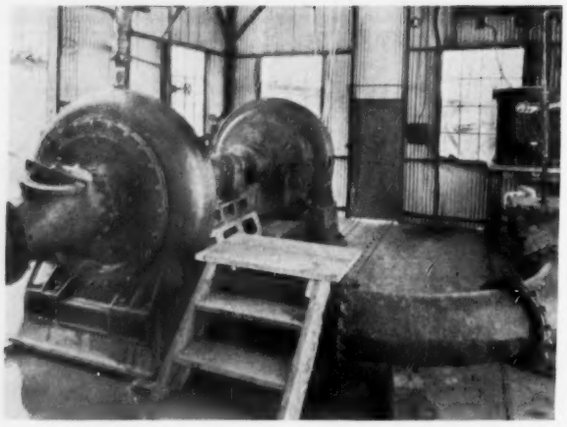

FIG. 3 — Suction and discharge pipe line fittings for this 15-inch pump installation on the dredge are of manganese steel

place, spaced at regular, short distance intervals, to which are attached heavy lateral spacing plates. All connections of the diaphragm elements are made by semifinished bolts fitting accurately reamed holes, resulting in rigid completed hull and permitting field assembly work to be done readily by the crew of the user.

Suppliers of the structural steel made a complete, rigid shop assembly, carefully marking all connections, thus insuring correctness of field assembly. All structural steel design work, with the exception of the ladder frame, was carried out by the Pittsburgh-Des Moines Steel Co., Des Moines, Iowa. Fig. 2 shows the completed structural shop assembly, with one frame bent of the cabin bolted into place on the hull portion and the forward or outrigger pontoons and their A-frame structure. This illustration shows clearly the location and outer details of the diaphragm construction of the main hull; also the heavy I-beams used for the ladder drive gear mechanism support, along with smaller I-beams used for the hoist sub-base.

Length Is 105½ Feet

The two forward outrigger pontoons are each 25 feet long, 10 feet wide and 4 feet 6 inches deep, of the same construction and bracing as the main hull pontoons. In plan view these pontoons have been spread to give a distance of 9 feet between their inner edge wall faces. They have been placed 12 feet 6 inches ahead of the front end of the main hull, which distance gives suitable free end clearance length of well for the ladder of 45 feet starting length. As now assembled the overall fore and aft dredge length is 105 feet 6 inches.

The A-frame on the pontoons is of special heavily designed rectangular construction, using main upright legs of latticed channel column design, which support the head block of double channel design. Heavy double-angle construction fore and aft bracing is used from the tops of the columns to the stringer frames at the ends of the pontoons.

The cabin is framed of structural steel, well braced, sided and roofed with galvanized corrugated sheet steel. In its framing provision has been made for transferring and handling equipment by placing I-beam trolley tracks for accomodating hand-operated chain falls. Ample light facilities are provided with the entire front end fully sashed and the sides and aft end equipped with large windows. Roof ventilators provide proper upper room ventilation.

Manganese Steel Chain

Digging ladder is a traveling chain screening nozzle type design with 15-inch pipe and 45 feet in length. Frame is of heavy bridge-type structural steel construction. Traveling chain, driving sprocket and track liners are of manganese steel to resist abrasive action of materials dug. Chain is of 12-inch pitch, with major screening openings of 7 by 9 inches, permitting maximum sizes of solids of practically these dimensions to enter into the nozzle or suction pipeline mouthpiece opening. Travel of the chain is about 40 feet per minute. Drive is powered by a 30-horsepower motor.

The suction pipeline is a smooth, clean system from the ladder nozzle to the pump with a minimum of bends. A 15-inch heavy-duty dredge pump of bottom discharge design is used, directly connected through a flexible coupling to a 500-horsepower fully inclosed slip-ring motor with full load speed of 505 revolutions per minute. Water end parts of the pump are all of manganese steel, accurately machine finished where necessary to assure correct fit. Fig. 3 shows the pump and drive as installed in the dredge. Dressed oak sills 2½ inches thick are used between the deck and the pump base to provide auxiliary cushion mounting.

Certain portions of the deposit bank faces require preliminary breaking down and sluicing with high pressure water monitor jets. A high head, 4-inch by 3-inch centrifugal water pump equipped with a 40-horsepower motor has been provided to handle the dual operations of both the jet work and priming of the dredge pump.

Three-Drum Hoist Used

The hoist is a heavy-duty three-drum type, powered by a 40-horsepower slip-ring motor provided with variable speed control and solenoid brake. The middle drum is used for raising and lowering the ladder; outer drums are used to attend to the combination of side swing and head pull of the dredge. Fig. 4 shows the interior of the forward end of the cabin with the hoist and various controls.

All dredge equipment is individually powered by electric motors, thus making for maximum flexibility of operation and economy. Electric power is brought to the dredge by a three-wire system from a shore transformer station by wires mounted on poles, with cross arms and insulators, carried by the discharge pipeline pontoons.

The entire undertaking reflects good dredge boat construction, providing efficiency and economy distinguished from being merely adequate. In operation, performance is smooth, the operator being afforded complete control of the entire hydraulic installation with minimum expenditure of effort.

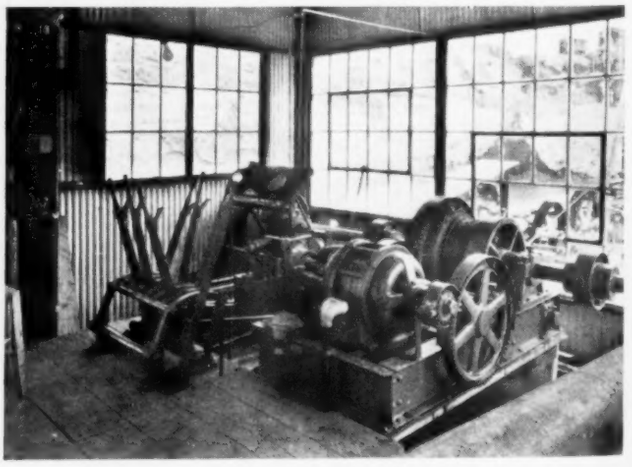

FIG. 4—Interior, forward end, cabin view, showing the operator's platform position with centralized controls

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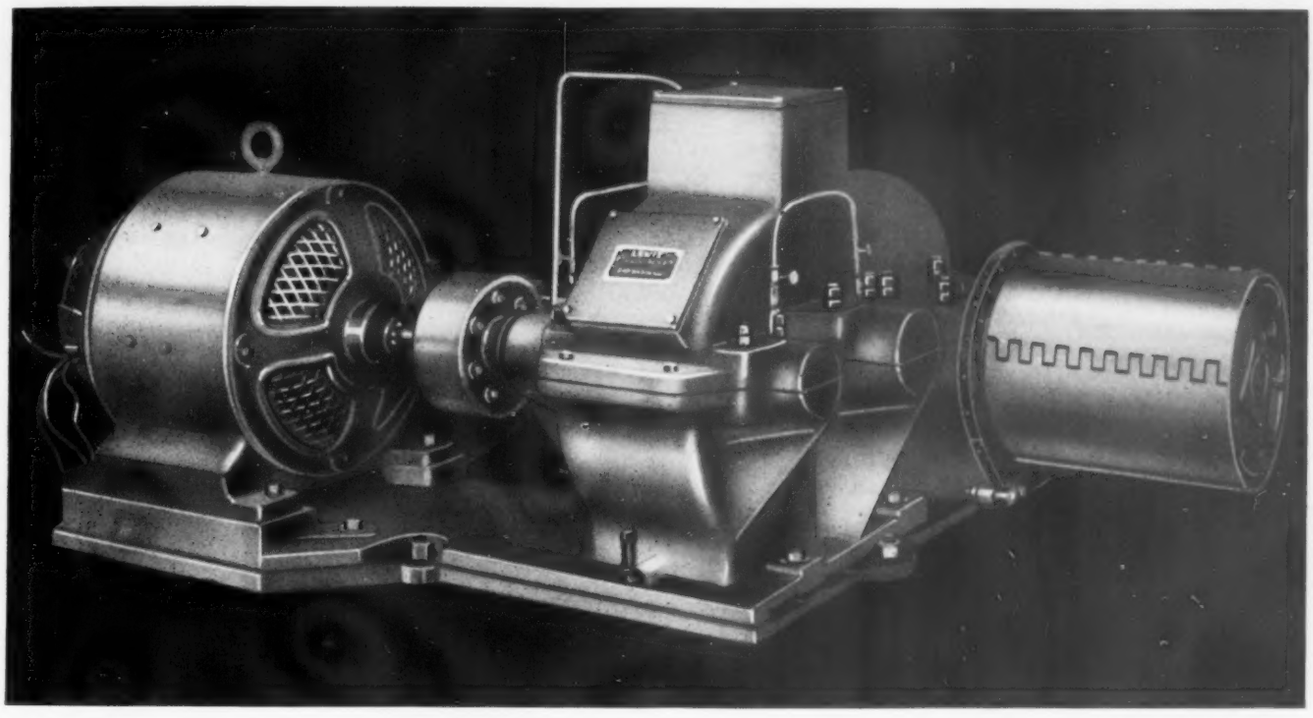

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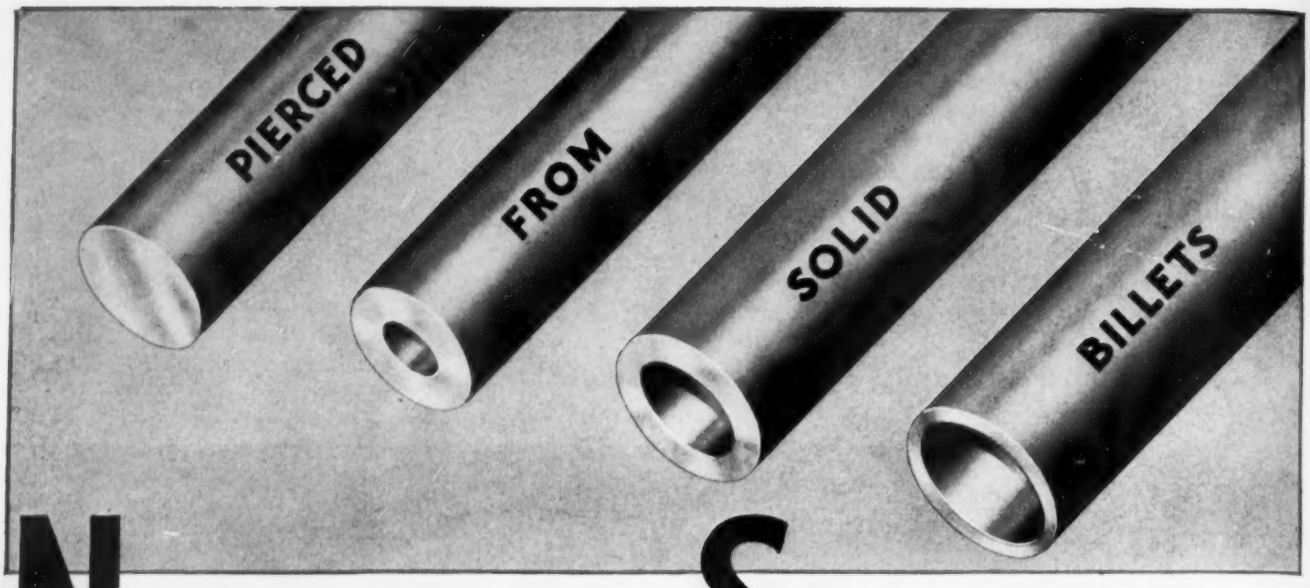

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IMPROVING OPEN-HEARTH FURNACE DESIGN

By WILLIAM C. BUELL JR.

Part II—Back and Front Walls

(Tenth Article of Series)

OPEN-HEARTH furnaces in which magnesite brick is used have the most costly back walls. Furnaces D and M with back wall refractory costs of $2380, C with $2390, and L with $2338, as shown in Table XVI, are examples of an unwarranted expenditure of money. These figures are over one and three quarter times that of the refractory cost of YD.

The preferred back wall design, Fig. 19, has a brick height vertically of about 4 feet and ½-inch. Of the back walls of Fig. 17 four are lower than this and all others higher. At the average temperature encountered in service the thermal expansion of firebrick is about 1/16-inch to the foot while for silica, magnesite or chrome brick it is about 3/16-inch. It is evident that in a 4-foot fireclay back wall, the ¼-inch total expansion upward virtually may be ignored, but the ¾-inch movement of the other materials may cause an appreciable movement of the roof if floating or suspended skews are used, or the creation of severe stresses in the buckstays if fast skews are used. The foregoing merely is another excellent reason for the more general adoption of firebrick as the principal component of back walls.

Table XXVI

Back Wall Closure and Angularity

Furnace	Type of back wall	Type of closure	Outer back wall angle
A	Straight	None	None
C	Semisloping	2" grids*	72°-43'
D	Sloping	1" plate	54°-0'
E	Semisloping	¾" plate	45°-0'
F	Straight	None	None
G	Semisloping	None	None
H	Sloping	1" plate	48°-34'
I	Sloping	2" grids*	56°-0'
J	Sloping	1⅜" plate	55°-0'
K	Sloping	1¼" plate	47°-49'
L	Sloping	1" plate	55°-30'
M	Sloping	1" plate	54°-18'
N	Sloping	None	54°-47'
O	Sloping	None	52°-34'
YD	Sloping	2" grids*	51°-30'

*Cast steel.

Movement Unimpaired

In the preferred design, the half course of chrome brick used between the granular material and the firebrick is free to move upward from expanding effects without bearing either on the roof directly or the skewback brick.

Customarily, back walls have no casing on the outer surface, the brick of the back wall itself acting to define its contour; or steel plate is used. Of the back walls under analysis, those of furnaces A, F, G, N and O, are without casing. Although this older design has long been considered proper practice, it is doubtful if it can be so considered today. Furnaces D, E, J, K, L, and M are plate covered.

Grid System Is Employed

Lately, plate covering has been considered satisfactory and is undoubtedly a great improvement over bare brick. However, the use of plate offers little or no strengthening effect to the steel binding system, is difficult to remove if repairs to the underbrick work are necessary, and often warps and becomes unsightly. A system of grids of cast steel, such as are found on the back walls of furnaces C and I and in the preferred design Fig. 19, is a great improvement over any prior design. The grids, which are of about 2-inch cast steel section and which space and assist to keep the buckstays in alignment, are so cut away that back wall brick inspection is made easily. Moreover, if repairs are required, the grids are removed easily. Fig. 19 also indicates the preferred method of holding these girds in place (the same

Table XXVII

Height of Front Wall for Recommended Back Wall

Furnace rating, tons	Height H, ft. - in.
100	5 - 6
150	5 - 8
200	5 - 10
250	6 - 0
300	6 - 1
350	6 - 1¾

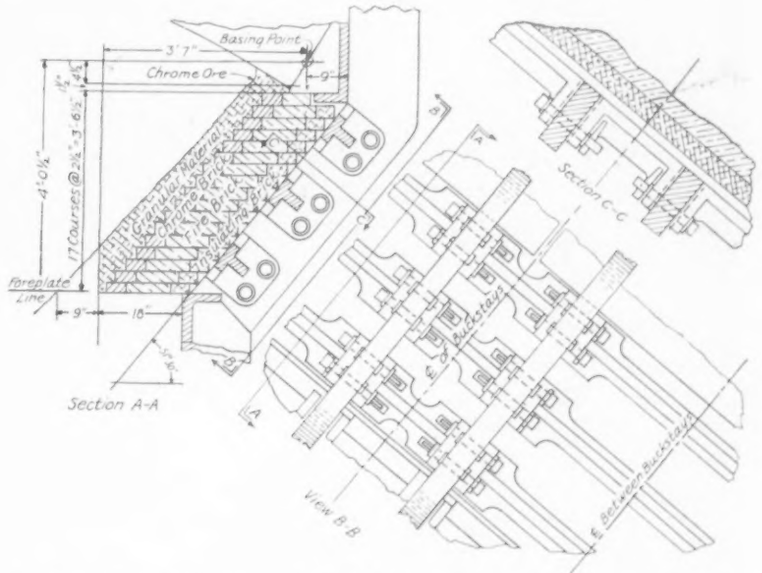


Fig. 19—Preferred back wall design which includes a system of cast-steel grids for maintaining the alignment of buckstays

method may be used wherever cast metal plates must be fastened to the buckstays). The method, on which a patent is pending, consists of using a pin having a slotted end into which a drift pin is driven. This eliminates the necessity of using threaded bolts and nuts which tend to stick together in service, and which usually must be destroyed when removal is necessary.

Details of the back wall casings and the angle from the horizontal to which the buckstays of the various furnaces are formed to permit the development of the back wall angle are given in Table XXVI.

Front Walls

The front wall of a modern open-hearth furnace consists of a series of jambs at the outsides of the end doors and between the interior doors. These jambs vary in width from about 4 feet to more than 6 feet and extend vertically from the foreplate line to the skewback brick. In some cases brick arches are used over the doors; in others, a water-cooled lintel is used, on top of which brick are laid to protect the skew system.

Ordinarily, the front walls are 18 inches thick at the foreplate line and may either maintain this thickness throughout their heights or may be corbeled to 13½ inches, the steps of the corbel serving to hold the granular hearth material in place.

However, the reduction of the front wall thickness to 13½ inches and its continuation in that thickness to the skew line is a mistake for it virtually is impossible to develop a skewback brick to this wall thickness that will be satisfactory.

As the wall nears the top it should be corbeled outward again to the original 18-inch thickness in order that the skewback brick may be better protected from furnace gas and flame action, which is particularly severe in this region. The design indicated may be criticized on the point that this corbel will be cut away. Even if the corbel lasts only weeks or even days, the roof life will be insured to at least the same added period against its collapse through the failure of the skewback brick.

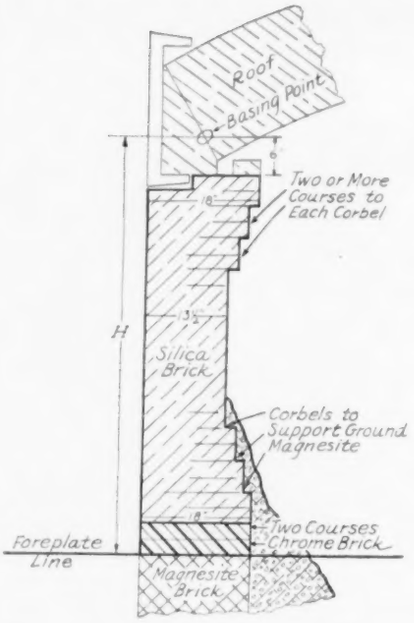
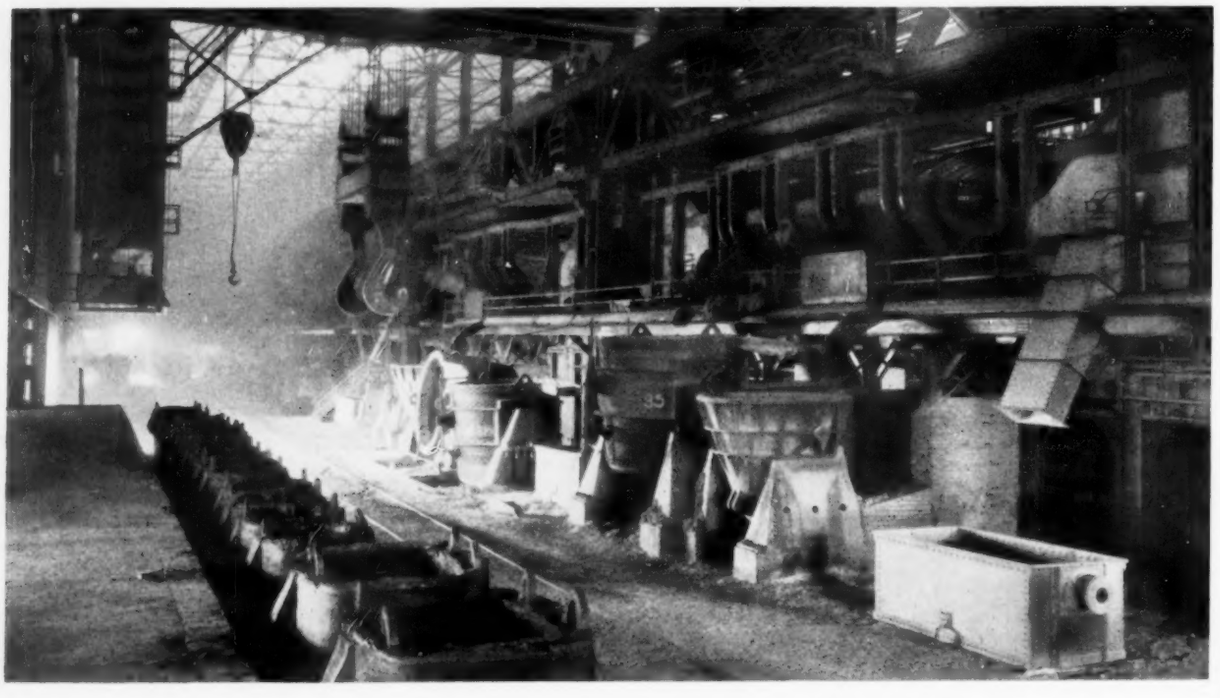


Fig. 20—Recommended front wall design

In the development and patching of the hearth the granular hearth material is maintained at as high a position on the front wall as is possible. The front wall or door jambs and door arches probably are subjected to the most severe usage of any of the furnace components. The mechanical abuse inherent to charging the furnace and the furnace operator's inability to see the exposed surface and to patch it properly when necessary cause frequent failure and the ensuing "hot" replacement or patch is seldom, if ever, satisfactory. However, as an improved generic front wall design does not seem possible, the present type must continue to be used and its unsatisfactory performance charged against the furnace as an inherent defect of existing design and practice.

Silica Brick Is Used

Front walls always are constructed of silica brick. Suggestions of betterment of front wall design and construction can be offered in minor detail only. Probably the best design possible is that shown in Fig. 20. In this design the height, H, may be standardized to the back wall of Fig. 19 as indicated in Table XXVII. The use of two courses of chrome brick on top of the magnesite brick of the bottom as shown is to be recommended. The contact of the ground magnesite and the silica brick above the chrome brick is poor practice, but it is doubtful if a 4½-inch facing of chrome brick could be incorporated into the silica brick without weakening the wall. However, this would be advantageous if accomplished. The best practice is to use a brick arch over the doors rather than the water-cooled lintel. The brick of the door arch should be molded especially and carefully fitted to develop a flare enlarging into the furnace. A carefully designed and layed door arch will



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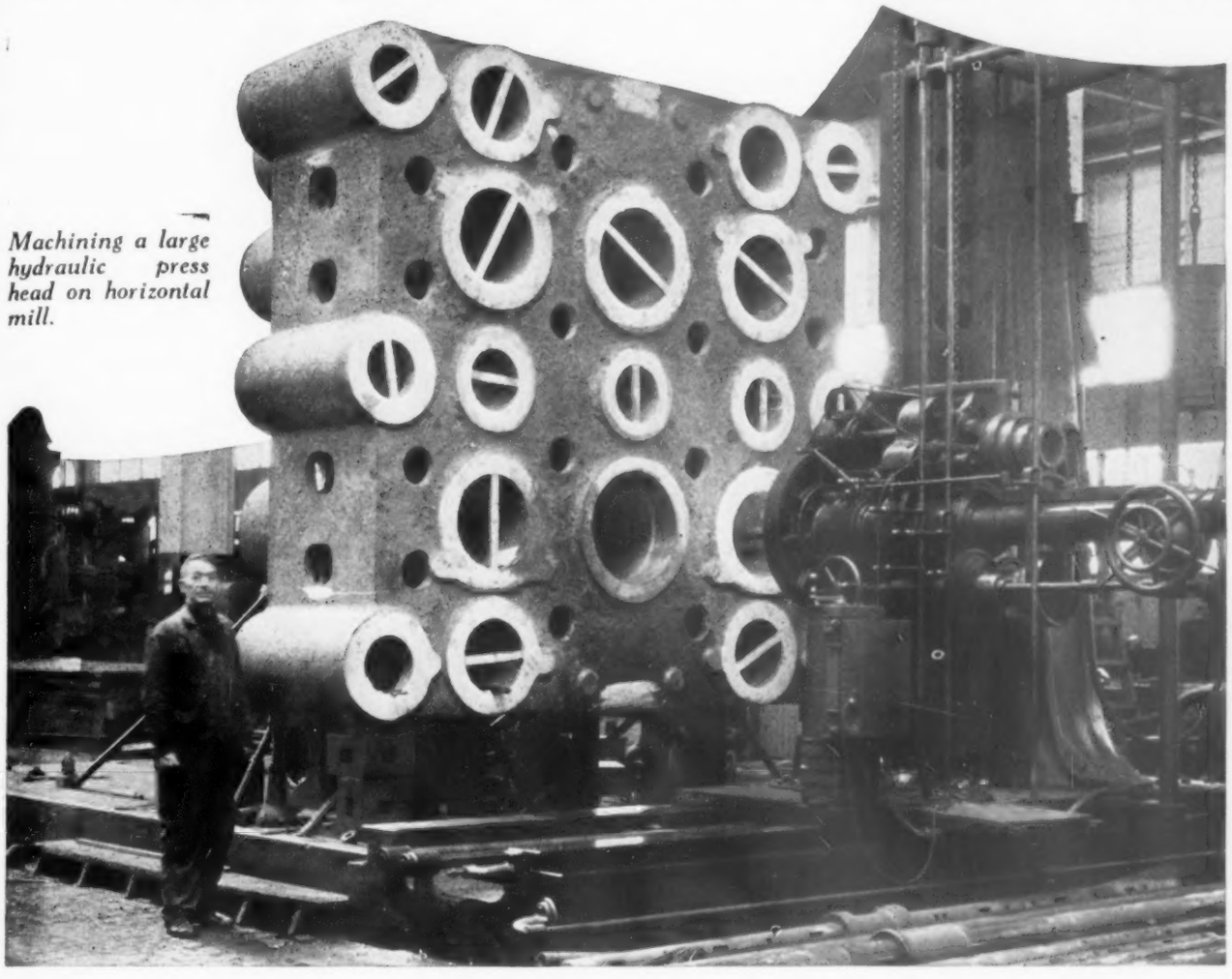

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last as long as the jambs, provided, reasonable care is exercised by the charging machine operator to prevent injury when charging.

The sloping type back wall should be used in all new construction. The general use of silica brick should be eliminated in favor of the chrome brick, firebrick, insulating brick back wall employed in accordance with the principles discussed. Appreciable savings in first, upkeep and operating costs should follow the incorporation of an improved design. The sloping back wall at least always should have a metal covering. The cast grid system appears to offer considerable advantages over the use of plate. Little improvement appears possible in the design of front walls which, due to the exigencies of accepted practice, are universally subject to great mechanical abuse.

(To be continued)

Beryllium-Copper Alloys on Display

A NEW series of beryllium-copper alloys has been announced by American Brass Co., Waterbury, Conn., to be exhibited this week for the first time at the National Exposition of Power and Mechanical Handling, New York. The alloys possess high physical values which can be increased appreciably by heat treating. The range of composition for commercially useful beryllium-copper alloys is indicated to be from 1 to 2.5 per cent beryllium and the balance pure copper.

Principal physical advantages are high tensile strength, high fatigue limit, hardness and resistance to abrasion. Electrical and thermal conductivities are relatively high, depending on the heat treatment, and resistance to corrosion is comparable to that of copper. An example of response to heat treatment is illustrated by a test specimen of beryllium-copper in which tensile strength was increased from 108,000 to 190,000 pounds per square inch.

Initial Production Limited

For the time being, production of the alloys will be confined to sheets, strip, rods, wire and tubes in the sizes and gages in which phosphor bronze ordinarily is furnished. They will also be supplied in the form of die pressed forgings within certain manufacturing limitations.

The company also announces the development of thin copper sheets designated as electro-sheet copper, furnished in weights from 1 to 8 ounces per square foot, and unlimited in length. Electro-deposited sheet copper is claimed to be strong, ductile and highly resistant to corrosive agents. It is relatively inexpensive and has a wide range of applications, such as in multiple-ply roofs for buildings and, backed with suitable fabric sheet, in automobile tops. The material also is being considered as a protective covering for steel pipe lines, both the buried and exposed types.

Standardization Work at Peak Activity

More organizations and more individuals are now engaged in the establishment of national technical standards in American industries than at any other time since the beginning of the national standardization work in 1918, declared Bancroft Gherardi, vice president, American Telephone & Telegraph Co., New York, in his address as retiring president of the American Standards association at the annual meeting of the association in New York last week. During the past year, 43 new national standards were approved by the association and 32 new national standardization projects were initiated.

A report on significant new standards and standardization projects was presented by Cloyd M. Chapman, who was elected for the third time to the chairmanship of the standards council of the association.

Will Construct Cableway For Hoover Dam Project

Contract for the largest cableway ever constructed has been awarded the Lidgerwood Mfg. Co., Elizabeth, N. J. The cableway, 1250 feet long, will span the Colorado river for operation in connection with the Hoover dam project, Boulder City, Nev.

It will consist of six steel track cables, which will support a control carriage, equipped for carrying loads up to 150 tons. The cables will be supported by steel towers on either side of the canyon. The installation will be in operation around Feb. 1, according to present plans. Contracts for the materials required are now being let.

Demonstrates Electrical Control Equipment

More than 100 engineers including prominent steel mill electrical engineers attended a demonstration of electrical control equipment and new circuit breakers at the East Pittsburgh, Pa., plant of the Westinghouse Electric & Mfg. Co., Nov. 29. A demonstration of the "De-ion" breaker was made on a power arc of approximately 20,000 amperes at 6600 volts. Included in the demonstration was a test on a low-voltage "De-ion" breaker.

New Brazing Process for Attaching Carbide Tool Tips

Attaching cemented tungsten carbide tool tips to various types of steel shanks is claimed to be facilitated by a new patented brazing process, known as the Z-foil process and developed by Thomas Prosser & Son, 15 Gold street, New York. Advantages of the new method, as set forth by its sponsors, are that it eliminates necessity for dovetailing the tool tip, minimizes tip cracking in service, does not injure or affect the strength of the tip, and provides a cushioning effect to absorb shocks.

Plan Engineering Week For Chicago Exposition

The Century of Progress exposition at Chicago has arranged for an "Engineering Week" to be held June 25-30, 1933. A joint committee of engineering societies has been formed in Chicago to stimulate interest in this endeavor and to arrange for the program and other details of an "Engineers' Day," when the engineer will be lavishly entertained and eulogized.

Arrangements are being considered to make this occasion of international importance, as many scientists and engineers of world renown will be in Chicago at that time. Other large engineering and power activities are being arranged for the same week at the exposition.

Steel Floors Approved By Philadelphia

Approval for the use of steel floors in Class 1 buildings in Philadelphia was granted recently by the bureau of buildings in that city. This is said to be the first major city to extend such recognition to this improved method of building and it should be of great assistance in obtaining similar approvals in other large cities.

According to the American Institute of Steel Construction, this marks an important future development in the use of steel floors in major buildings especially as it includes the use of steel floors as horizontal stiffening members in wind-braced buildings, provided that the connections between floor units and between floor panels and beams and girders are sufficient to develop the full horizontal shear.

Making the Most of

METHODS AND MATERIALS

AN ENGINEER, whose company in 1930 figured on machinery involving about $100,000 only to have the project held up, has been instrumental in having the sales department check up on the possibility of this order being released soon after signs of business improvement are more convincing. The sales manager has discovered that the outlook for early award of the contract is favorable. The engineering department is all set to go and is believed to have several weeks advantage over competitors.

S S S

A company in the Pacific Northwest which markets flour in 2-pound cellophane sacks displays the product in grocery stores on steel racks. These racks were being made at high cost, but by a simple design change it was possible to fabricate them by oxyacetylene welding at a saving of $1.35 each. When this change was effected, 1000 racks were yet to be made.

S S S

WITH many types and sizes of stampings to handle and with an equally large number of heavy unwieldy dies to be moved and placed in position, a Central Western manufacturer uses a fleet of electric storage battery industrial trucks to good advantage. These trucks are utilized in co-operation over overhead cranes, overhead conveyors and a number of hand trucks. Traveling back and forth from tool and die rooms to storage and from storage to the presses, it is estimated that these trucks have reduced the time required to change dies from 60 to 70 per cent. The company operates 14 batteries in its trucks and for four years of service the total repair cost has amounted to only $24.73, the greatest part of this being in connection with one battery which accidentally fell off the loading platform. This maintenance expense is about 44 cents per year per battery.

S S S

Spraying of molten metal is finding use in repairing and building up machinery, particularly that used in the marine industry. One case of interest was a generator crankshaft which was considerably worn down. This piece of equipment ordinarily would have been scrapped and a new piece ordered; however, by metal spraying the shaft was built up to the desired thickness and machined down to exact size ready for use. The steamship company paid about half the price for metal spraying that it would have for a new crankshaft.

S S S

Case hardening in liquid baths may be regarded as a reaction of the bath with the surface of the steel to form iron carbide which diffuses into the

steel. Oxygen or oxygen-containing compounds are shown to have an influence on hardening with sodium cyanide.

S S S

A manufacturer of porcelain enamels has increased the pickling time in practically all the plants to which it sells enamel in order to insure an absolute removal of the outer surface of the sheet so that an open and more or less porous surface is exposed, which is ideal for good enameling. This feature is plainly evident in jobbing shops where four or five types of steel are being run. One steel has to be treated entirely different as to the length of pickling time than others, and it is only when the enameler recognizes this feature of steels as being made today that he will reduce his troubles to a minimum. Unless the cause is basically in the steel itself, which case can be proven easily by sand blasting the steel and running it commercially, cases of copperheading and fishscaling many times are traceable directly to lack of proper pickling.

S S S

A manufacturer of sheet steel drums now uses hard facing for all of his shearing and forming equipment for all services. In one instance double seamer heads were made of 11 pounds of very select quality tool steel costing 35 cents a pound. These heads lasted from three to four months and then were discarded. Present practice is to make the entire piece of ordinary machine steel costing 5 cents per pound and to tip the wearing edge with stellite. The tool now lasts 18 to 20 months before the edge wears out of gage and is then refaced, so that it lasts indefinitely.

S S S

RAILROADS and carbuilders are considering the use of chromium-manganese-silicon steel as a means of lightening the weight of cars. This steel contains 1.20 per cent manganese, 0.50 chromium and 0.75 silicon. In the as-rolled condition, without heat treatment, it has 100,000 pounds tensile strength, 60,000 pounds yield point and 50,000 pounds proportional limit. It is readily welded, and now is being produced commercially in the form of shapes, plates, tubing and bars. Welded cars, built of this steel, would represent a saving of about 40 per cent in weight, thus cutting down materially on the nonrevenue load.

S S S

Care is necessary in choosing the material to form joints when high nickel and chromium cast steel fittings are used with pipe lines of the 18-8 range of rolled steel products, according to an engineer identified with the sulphite paper industry. Reaction between the components to induce corrosion is encountered when monel metal is used. Rubber is ineffective. Joints of bronze alloys or lead have the preference, it is said.

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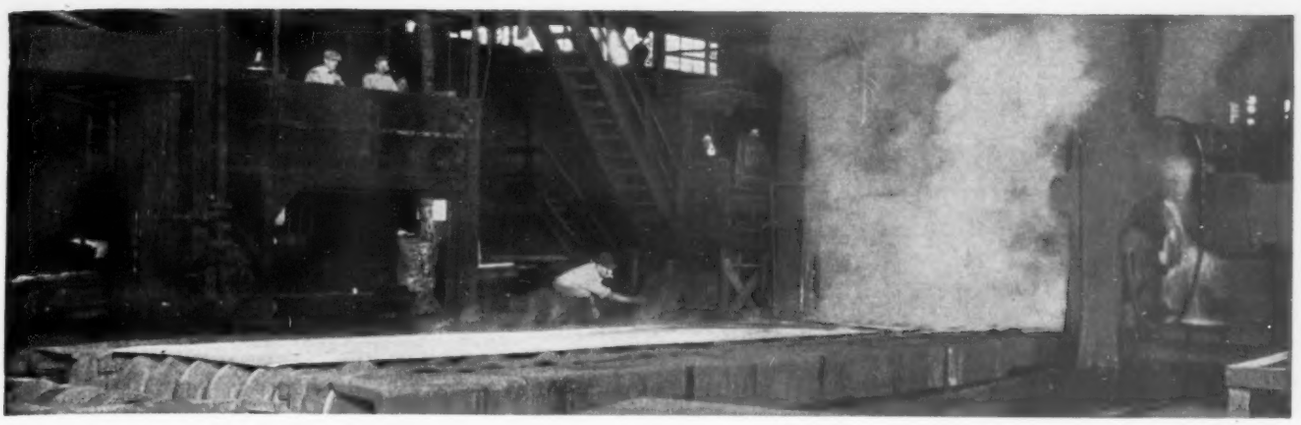
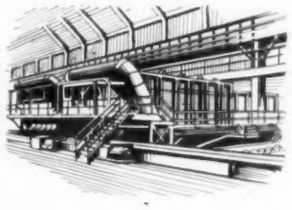


PROGRESS IN STEELMAKING

SAFEGUARDING two pressure-type disintegrators installed in the gas-washing system at a plant in the Pittsburgh district for fine cleaning of blast furnace gas in transit to the by-product coke ovens, is accomplished by a novel control method which always maintains the inlet main under pressure. As the inlet pressure decreases, a control throttles the discharge line; should the pressure in the inlet main fall below a predetermined low pressure setting, a second control brings the disintegrator to rest.



JOINTS in the refractory lining of steel mill reheating furnaces, frequently the cause of early failure, now may be closed securely by a recently developed refractory cement. Fire clay, properly proportioned and scientifically compounded, comprises the base of the new mortar. Tests disclose a strong air set with firm bonding action at all furnace temperatures and freedom from shrinkage and vitrification. With full troweled joints about 500 pounds of the cement is required to lay up a thousand 9-inch standard firebrick and dipped joints 350 pounds.

♦ ♦ ♦

Details of the new "tungum" metal recently exhibited in London discloses it to be a nickel-copper-silicon alloy. The metal is highly resistant to acid corrosion, particularly that caused by hydrochloric, sulphuric and acetic acids, as well as sea water. Physical characteristics of the new alloy are similar to mild steel. It can be drawn into wire suitable for number 200-mesh gauze, brazed, welded, machined, spun, tempered and soldered.

♦ ♦ ♦

Liquid carbon dioxide is used in the black enameled wire department of a mill for extinguishing fire at the enamel vats. A blanket of the gas free from water or other liquid is discharged from an extinguisher and smothers the fire. Corrosion of equipment as well as a cleanup after a blaze has been extinquished thus are obviated. As an extra precaution carbonic acid and foam extinguishers also are available.

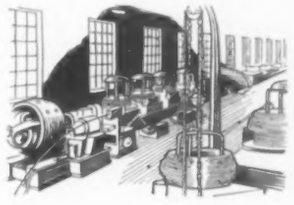
♦ ♦ ♦

Cold rolled strip steel coated with copper is the product of a producer of finished steel in the Pittsburgh district. The strip passing through a coating machine receives a covering of flux and powdered copper and then is subjected to a temperature of about 2000 degrees Fahr. The copper penetrates the pores of the steel and can only be removed by abrasion. The new commodity can be spot welded, tinned, soldered and hydrogen brazed. Substantially the same process is used by the company for coating cold strip with zinc but at a lower temperature.

BROKEN wabblers on a 25-inch 3-high structural mill recently were repaired by thermit welding at a saving of $850, in addition to the time saved, shop congestion and time and cost of annealing. The original cost of the roll and wabbler amounted to $1000 whereas the cost of welding, labor and material was $150.

♦ ♦ ♦

Determining the yield point of a steel specimen being tested in a tensile machine may be accomplished readily by the use of a newly devised precision instrument so sensitive that it will indicate the elongation in a standard test piece occasioned by the heat of the operator's hand. The device also may be used as a strain gage to determine the elongation of a test piece under a specific load.



SUSPENDING the drawing block of a wire drawing machine on its drive shaft is one of the latest means employed for increasing the production of wire. Instead of lifting the wire over the top of the block upon completion of the draw, the finished coil immediately drops to a receiving table from which it can be loaded on a transfer truck without lifting. The lapse of time between stripping the wire from the block and starting a new coil is greatly minimized and affords higher output.

♦ ♦ ♦

Coating the face of gag press hammers with a layer of wear-resisting alloy has increased their life 10 times compared to former practice.

♦ ♦ ♦

Coating heated molybdenum steel ingots and billets with borax prevents serious surface deterioration and permits the rolling of bars having a uniform content of molybdenum and carbon, according to government metallurgists.

Scanning the Field of Technology

A Digest of Important Developments Pertaining to the Production, Processing, Application and Performance of Steel

Development of Special Steels for Castings

By R. A. Bull, a paper presented at the annual meeting of the American Society of Mechanical Engineers in New York, Dec. 5-9, preprinted, 7½ pages.

During the past 15 years there have been numerous developments, in chemical composition and in heat treatment, for the manufacture of steel castings. During the last 10 or 12 years there have been installed many electric furnaces admirably adapted for the production of special steels for castings. A huge task assumed by the steel casting industry has been to determine by actual experiment what properties result from combinations reasonable to consider from the standpoints of first cost and economical service. This paper discusses the diversified properties developed by heat treatment, the varieties of alloy cast steels, and the characteristics of special steels for castings. The industry is free to employ countless combinations of potentially useful elements that, after proper heat treatment, will provide desirable properties in the steel castings. Co-operation between consumer and producer of steel castings is recommended as essential to best progress and maximum economy.

—STEEL, 12-5-32

Survey of Nitriding Plant and Technique

By H. H. Ashdown, in Metals and Alloys, October 1932, *p.* 210, 4 *pages,* 6 *illusts.*

This article discusses equipment, apparatus and technique requisite for obtaining on an economical production basis the highest efficiency from the nitriding process. In its present commercial operation the process is one requiring a comparatively long period dependent on the depth and hardness of case required. It is practically automatic throughout this period, calling for little if any personal attention, apart from an occasional inspection of the control instruments. It has been made to appear a simple process and is so once one has become conversant with its limitations and the essential apparatus.

Experience of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., in nitriding work is described. A satisfactory and economical solution for the problem of container construction is to use nickel-faced rolled steel plate with the nickel ply face from 15 to 20 per cent of the plate thickness. . . . For all practical purposes a case depth of from 0.015 to 0.02-inch is fully adequate. . . . Of all the steels now available for nitriding, superior results in both cases and cores are obtained subsequent to a quench and tempering treatment. . . . All traces of grease and foreign matter must be removed from parts to be nitrided.

—STEEL, 12-5-32

Safety Equipment for Protecting the Welder

By F. H. Klein, in Welding, November 1932, *p.* 632 3 *pages,* 2 *illusts.*

Protecting the health of the welder exposed to the hazards of the occupation is a matter of first importance not only to the man himself but also to the employer, who strives to keep his production cost down by eliminating labor turnover and lost time due to injury or sickness for which the occupation is responsible. Primary hazards to the health of the welding operator are: Ultra-violet and infra-red rays of the light projected from the flame or arc; fumes cast off by the metal being welded; and the using up of oxygen when continuous welding is performed in confined spaces.

Impairment of vision or temporary discomfort, due to the absorption of ultra-violet and infra-red rays by the eye, is the most common ailment for operators, and the protection from these rays is of first consideration. Glasses with green lenses in which there is a small amount of iron to absorb dangerous rays have been found to be a most suitable protection. Adequate ventilation will do much to reduce dangers arising from the two other hazards.

—STEEL, 12-5-32

Equipping for the New Needs of Industry

Special section in Machinery, October 1932, *p.* 81, 38 *pages,* 65 *illusts.*

This review is intended as a brief summary of the practical possibilities which the latest machine tools, shop equipment and materials offer the manufacturer who is endeavoring to make a better product as well as to reduce manufacturing costs. Space is devoted to discussion of improvements in all types of lathes; electric motors; automatic screw machines; power transmission and lubricating methods; planers and shapers; drilling, boring, honing and tapping machines; milling machines; and the X-ray and electric eye.

Briefly, the newer types of machines have three characteristics that differentiate them from former designs. First, they have greater power, which implies that they are heavier, sturdier and more compactly designed; second, they have a greater range of speed, which implies increased production possibilities and greater adaptability to the work to be performed; and, third, their control and operation have been greatly simplified through introduction of electric and hydraulic means of control and more effective mechanical means of operation.

—STEEL, 12-5-32

Die Costs Reduced by Gas Cutting and Welding

By Everett Chapman, in Automotive Industries, Oct. 22, 1932, *p.* 530, 2 *pages,* 5 *illusts.*

In the application of gas cutting and welding to the fabrication of dies, heavy plates are available in thicknesses up to 16 inches and total weight as high as 55,000 pounds; these may be cut to any desired profile or sketch by means of the oxyacetylene cutting torch. This makes available immediately as a primary building block the various odd shapes that are required by the die industry, in a material that is stiff, homogeneous and without internal defects, and which can be welded at an economical cost. The science of welding is dominated by the principle that one may put the required amount of material in exactly the right place, and these materials may vary in composition. Thus, in building up a cutting die, an inexpensive low-carbon steel may be used in the main body and, where a hard shearing edge is required, a deposit of hard alloy may be built up which may be ground to the required contour. A number of examples are cited of various die sets built up by cutting and welding.

—STEEL, 12-5-32

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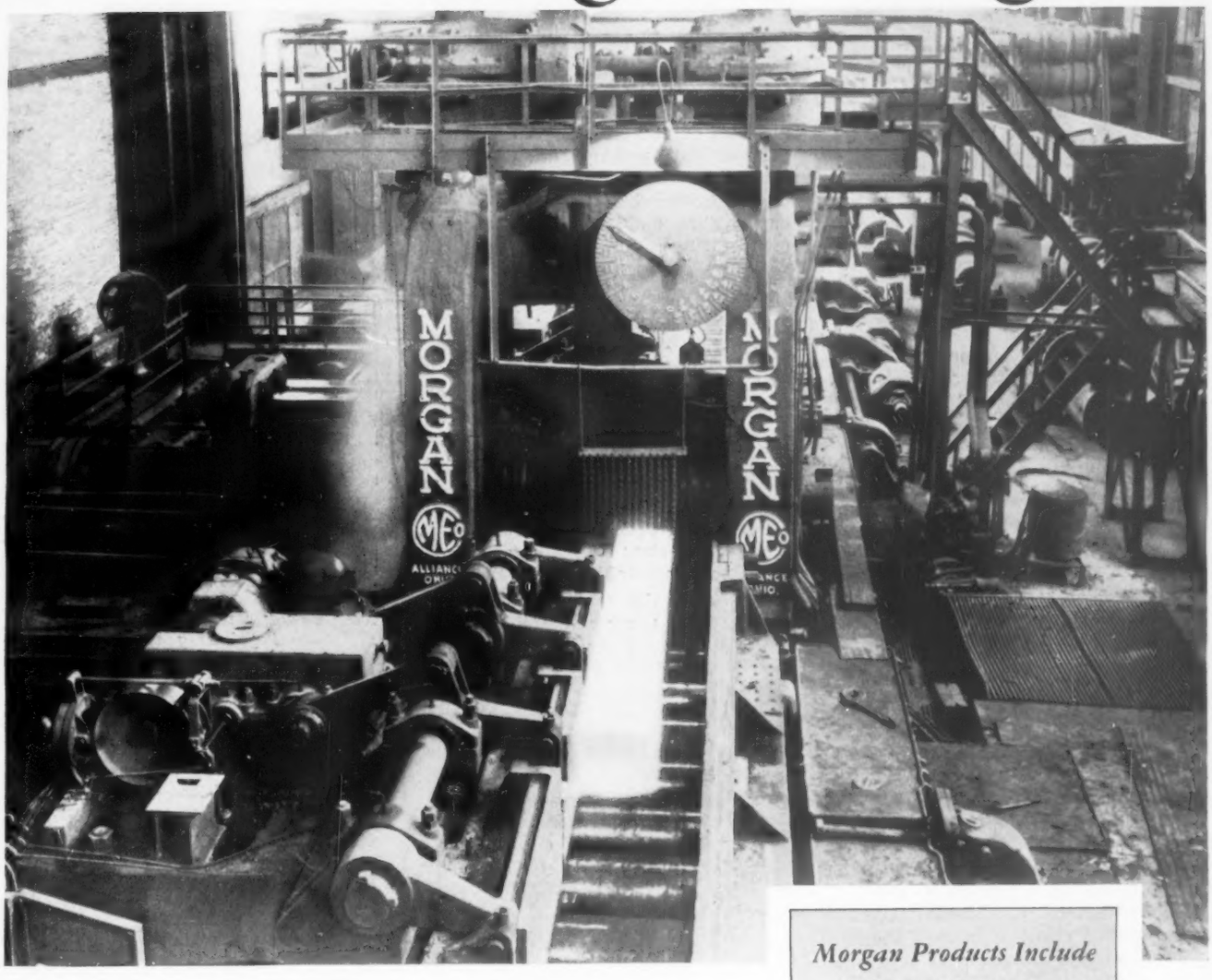

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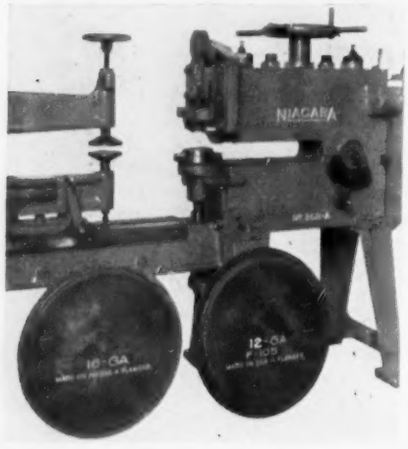
NEW EQUIPMENT

PRODUCTION FABRICATION TREATMENT FINISHING

Rotary Flanging Unit Makes Recessed, Flanged Heads

Niagara Machine & Tool Works, Buffalo, announces that its line of rotary shears and flangers has been used successfully to produce the standard type of round recessed heads, flanged for double seaming. This is accomplished by equipping the standard machines with special flanging rolls as shown herewith.



Standard Niagara machine equipped with special flanging rolls

The heads, also depicted in the accompanying illustration, are used in various diameters for the manufacture of drums, containers, tanks, etc., of double seamed construction. A machine with standard cutters first is employed to cut the flat circular blank. The cutters then are replaced by the flanging attachment with special rolls, which completes the head in a second operation.

One set of rolls will produce heads over a large diameter range when made by the flanging method, simply by adjusting the position of the circular arm.

◆

Designs Vertical-Type Motorized Reducers

Philadelphia Gear Works, Philadelphia, recently announced a vertical type MotoReduceR, shown at right. These units are available in single, double and triple types with ratios up to 450:1 and can be furnished with standard open-type or totally-enclosed fan-cooled motors, polyphase or single phase. Direct-current motors up to 10 horsepower may be incorporated in the unit.

All gears are made from heat treated nickel steel with helical cut teeth, and all bearings are of the anti friction type. The slow speed shaft is mounted on roller bearings which compensate for upward or downward thrust and take care of the side whip of the extended vertical shaft. This construction eliminates the use of the step bearings.

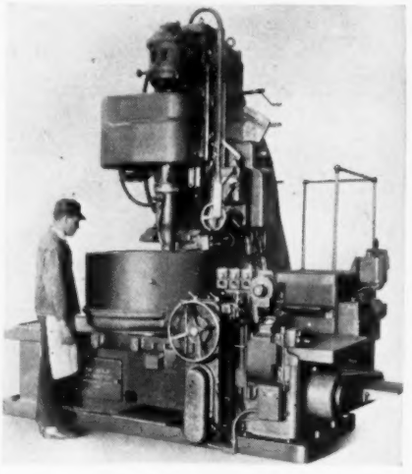
◆

Develops Vertical Internal Grinding Machine

Heald Machine Co., Worcester, Mass., recently introduced a heavy-duty vertical internal grinding machine adapted to grind straight or taper, internally or externally, as well as face grind. The unit shown in the illustration at the right is the 36-inch size; however, a 48-inch machine is available.

Drive to the wheelhead can be furnished in two ways. That shown is through an idler pulley arrangement and is necessary where considerable range of spindle speeds is required. The vertical wheelhead slide is operated hydraulically and controlled from the reverse control valve arrangement conveniently located to the right of the head. The slide is arranged with an elevator lock arrangement which latches into the slide to stop the slide from falling when the hydraulic system is shut off with the machine idle.

Vertical motorized speed reducer designed by Philadelphia Gear Works



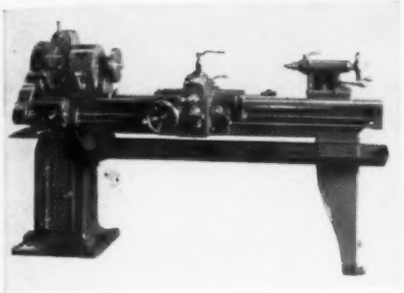
New Heald vertical heavy-duty internal grinding machine

Speed of the slide is controlled from a throttle valve lever and is reversed by another lever. The slide also has a hand feed which moves the slide up and down from the hand wheel. The wheelhead slide on a standard machine may be set up to 15 degrees on the side or 30 degrees included angle. The swiveling is accomplished by unlocking the slide by turning a crank.

◆

New Engine Lathe Embodies Interesting Features

R. K. LeBlond Machine Tool Co., Cincinnati, recently introduced a simplified engine lathe embodying safe, simple control and automatic lubrication. In addition to the eight selective speed changes the feed reverse and feed compounding gears are inside the head. Feed box; speed changes; feed reverses; feed compound and motor are within easy reach of the left hand of the operator



Simplified engine lathe built by R. K. LeBlond Machine Tool Co.

without moving from his working position.

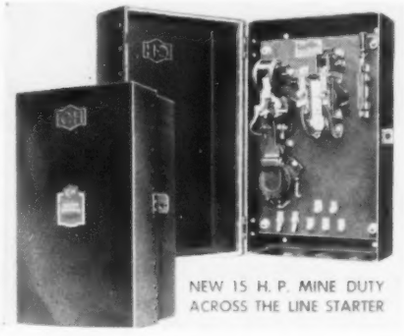
The apron of the lathe, shown herewith, is a double walled one-piece casting in which all moving parts run in oil, the rack pinion and hand wheel roll on ball bearings. A plunger pump in the apron reservoir lubricates the carriage and cross slide ways and the cross feed screw bearings.

The motor is mounted on a hinged plate on the rear of the leg. Its position requires no extra floor space and is high enough to be free of floor dust and eliminates any tendency to headstock vibration. The unit is built in sizes 12 and 14-inch with any bed length required.

◆

Automatic Motor Controller Provides Protection

Cutler-Hammer, Inc., 320 North Twelfth street, Milwaukee, recently introduced a new across-the-line automatic direct-current motor controller which employs a simple, novel, adjustable means of timing to allow the field current of the motor to build up to full strength before the circuit to the armature is closed. This feature protects and saves the motor by cutting down the current inrush about 50 per cent. The starter, shown in the accompanying illustration, was designed especially for use on shaker conveyor chutes in coal mines, but is recommended for all equipment that employs motors rated 15 horsepower and below, where starting duty is severe.



Cutler-Hammer motor starter mounted in dust-tight enclosing case

◆

Flash Trimming Unit Is Controlled Electrically

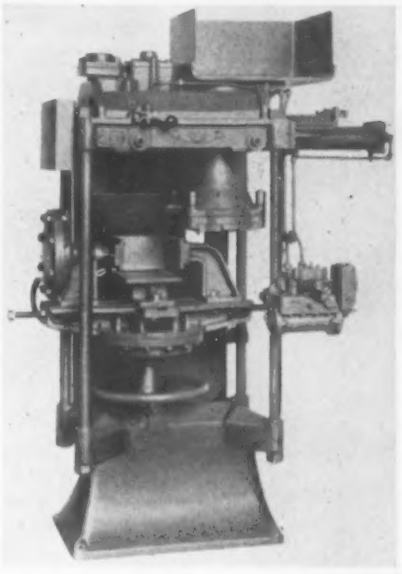
Morton Mfg. Co., Muskegon Heights, Mich., announces that its latest draw-cut flash trimming machine is designed for trimming the flash or upset from butt welded seams in strips, sheets or plates. The unit, shown in the accompanying illustration, has a 48-inch cutting stroke. This type of unit, however, can be furnished with any length of cutting stroke desired.

The trimmer is controlled by hand or foot push button. It also has removable liners to the ram bearings which assure accuracy in work. General design and construction of this unit are similar to those described in previous issues of STEEL, with exception that this new development is entirely electrically controlled.

◆

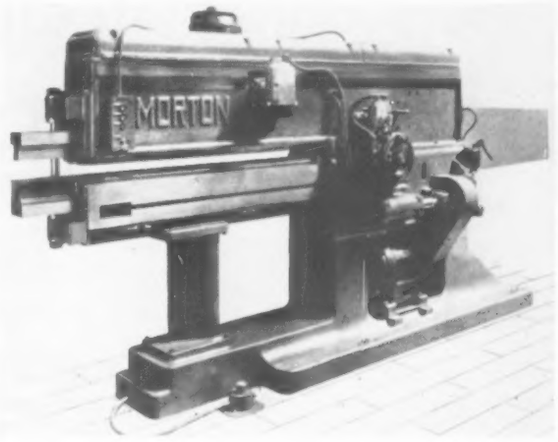
Core Blowing Machine Has Automatic Valve

Osborn Mfg. Co., 5401 Hamilton avenue, Cleveland, has introduced a core blowing machine designed to produce cores of uniform porosity and density at high speed. As shown in the accompanying illustration, the machine consists of a rugged base which supports the clamp table and clamp. Four vertical rods attached to the four corners of the base in turn support the sand bin and chamber, blow plate, valve and operating mechanism.



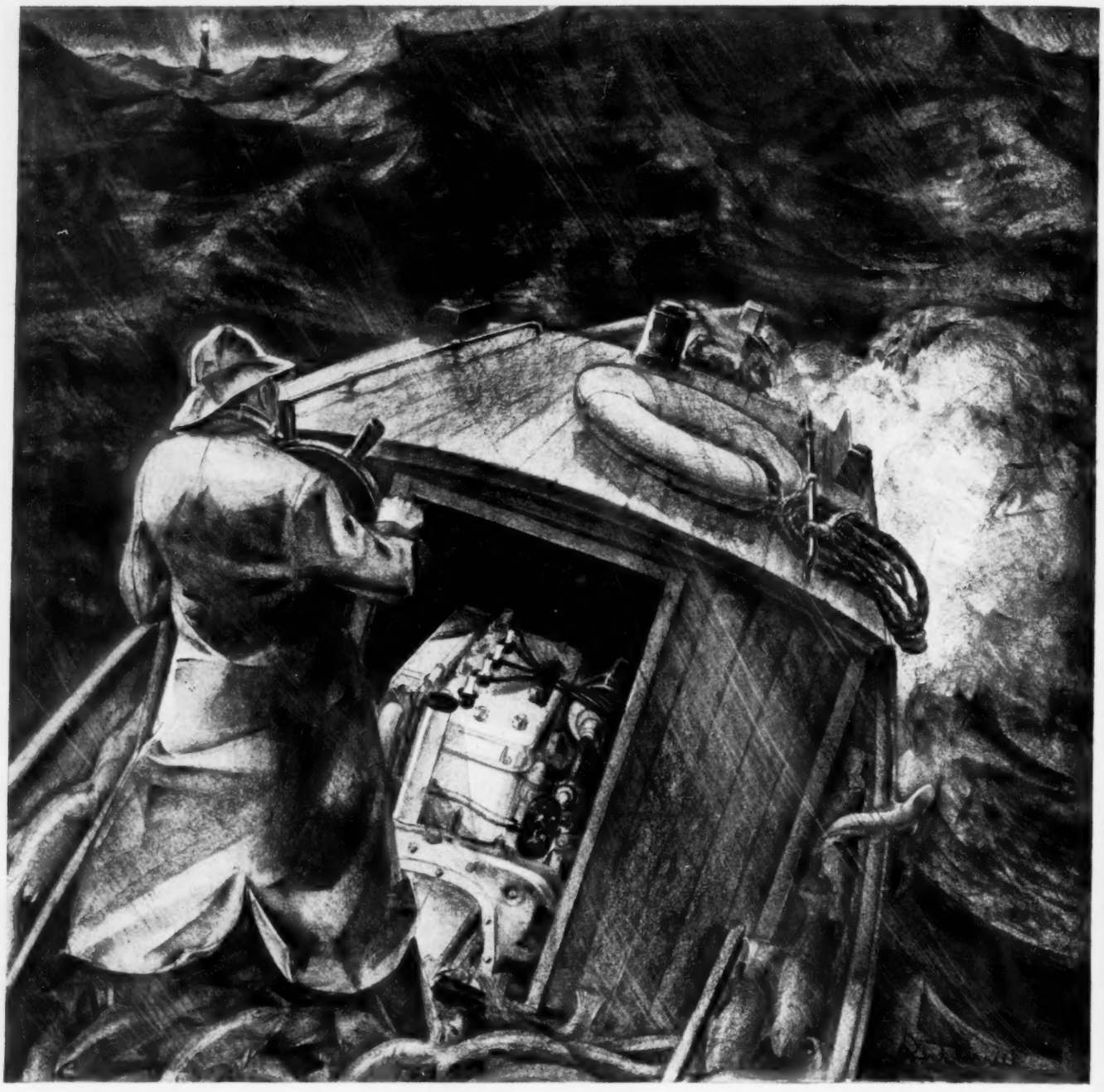
Core blowing machine recently introduced by Osborn Mfg. Co.

A feature of the design is the automatic valve which controls all operations in sequence following the movement of the lever by the operator, and provides a definite time allowance for each operation. In operating the machine, the operator places the core box in the machine. He then pushes the safety lever with the left hand and moves the valve lever with the right. After the valve starts to function, it will perform a complete cycle of operations without further attention, and the operator is free to take the core previously made from the box. The valve causes the clamp to close, the sand chamber to move over the box, the sand to be blown into the box, the sand chamber to return to the side of the machine and the clamp to release the box.



MORTON electrically controlled high-duty, draw-cut flash trimming machine designed for trimming the flash or upset from butt welded seams in strips, sheets or plates. Design facilitates easy loading and unloading of work

When the Emergency comes—



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208 South La Salle Street, Chicago, Illinois

Pig Iron Output Up Fractionally in November

Improvement of September and October, However, Almost Plays Out—Steel Rate Off to 16—Structural Awards Higher—Prices Are Being Extended

DESPITE a net gain of one in the number of blast furnace stacks active, improvement in production of pig iron which developed in September and continued in October all but reached the vanishing point in November, when the daily rate of 20,855 gross tons topped October by 60 tons or 1/3 of 1 per cent.

Total output of coke iron in November, at 625,663 tons, was slightly below the 644,648 tons of October, owing to the shorter month, and for 11 months the total is 8,126,798 tons, compared with 17,282,634 tons a year ago. Fifty-one of the country's 292 stacks were active Nov. 30, contrasted with 41 on Aug. 31, when production began to expand.

When official statistics on steel ingot activity in November are announced this week, the variation from October will be slight, but because steelmaking capacity is more flexible than pig iron, the trade believes the easier market situation which developed beginning about Nov. 20 may be reflected.

In the week ended Dec. 3, due to declines in every district except Pittsburgh, Youngstown and eastern Pennsylvania, the steel rate eased 1½ points to 16 per cent. At Buffalo there has been a drastic drop, following the close of navigation, while at Birmingham the adjustment the past three weeks has been severe. The intensity of these decreases will not be repeated. At 16 per cent, the improvement of October and November has now been wiped out.

To the list of major consumers of steel whose requirements have been ebbing, the automotive industry has been added. Its releases continue relatively high, and some small manufacturers are beginning to specify for pre-show production, but the tide of demand as a whole is beginning to run out. The ebb, however, is not accelerating and there still is no indication that the holiday trough will be deeper than seasonal.

Structural steel awards increased over 3000 tons in the past week, reaching 11,448 tons. As for a number of weeks, pending work is encouraging, but its transition to the order stage is dishearteningly slow. Interstate commerce commission approval of an R. F. C. loan to New Orleans for a Mississippi river bridge is a step toward a 60,000-ton award. Bids are in on the Colorado water project requiring 240,000 tons, and will be asked shortly on the 207,000 tons for the San Francisco-Oakland bridge.

Tin plate production has surrendered 5 points, to 35 per cent, with recovery possible later in the month as contracting by some users for their 1933 requirements is under way. Several eastern gas and utility interests are in the market for a portion of their next year's cast iron pipe needs. A plate fabricator at Cleveland estimates $1,000,000 worth of tanks for breweries is dependent upon congress.

Outstanding in the eastern markets is the taking of bids Dec. 14 on 7300 tons for a cruiser, with the prospect of six more within a year. American Car & Foundry Co. contemplates building 100 tank cars. Releases of track fastenings at Chicago continue fair, and both rail mills there are operating, though on short schedules.

Except at Chicago, shipments of pig iron have declined materially. Large stocks at blast furnaces and the extension of current prices into 1933 remove any incentive for melters to cover. Scrap is off 25 to 50 cents a ton in most markets, with dealers increasingly pressed to sell and consumers refusing to take in even small over-shipments. The steelworks scrap composite of STEEL is off 12 cents this week to $6.71.

Announcement of first quarter prices on heavy finished steel is expected daily. On most finished products present levels are being carried over. The iron and steel composite of STEEL is steady this week at $28.91, and the finished steel index at $46.70.

Composite Market Averages

	Dec. 3	Nov. 26	One Month Ago Nov., 1932	Three Months Ago Sept., 1932	One Year Ago Dec., 1931	Ten Years Ago Dec., 1922
Iron and Steel Composite	$28.91	$28.91	$29.12	$29.32	$30.32	$40.53
Finished Steel Composite	46.70	46.70	47.20	47.50	47.74	58.39
Steelworks Scrap Composite	6.71	6.83	6.87	7.04	8.16	17.28

Iron and Steel Composite:—Pig iron, billets, slabs, sheet bars, wire rods, tin plate, nails, sheets, plates, shapes, bars, and black pipe. Finished Steel Composite:—Plate, shapes, bars, hot strip, nails, tin plate, pipe. Steel Works Scrap Composite:—Melting steel, compressed sheets.

COMPARATIVE PRICES OF IRON, STEEL AND COKE

Representative Market Figures for Current Week, Last Month, Three Months and One Year Ago

	Dec. 3, 1932	Nov. 1932	Sept. 1932	Dec. 1931
Pig Iron				
Bessemer, del., Pittsburgh	$15.76	15.76	15.76	17.51
Basic, valley	14.00	14.00	14.00	15.00
Basic, eastern, del. eastern Pa.	13.50	13.50	13.75	16.00
No. 2 foundry, del. Pittsburgh	15.76	15.76	15.76	17.51
No. 2 foundry, Chicago	15.50	15.50	15.50	16.60
*Southern No. 2, Birmingham	11.00	11.00	11.00	12.00
**No. 2X, Virginia furnace	17.75	17.75	17.75	18.00
**No. 2X, Eastern, del., Phila.	13.76	13.95	14.26	16.01
Malleable, valley	14.50	14.50	14.50	16.10
Malleable, Chicago	15.50	15.50	15.50	16.60
Lake Superior charcoal, del. Chi.	23.04	23.04	23.04	19.90
Gray forge, del. Pittsburgh	15.63	15.63	15.63	16.88
Ferromanganese, del. Pittsburgh	73.24	73.24	73.24	84.79
Coke				
Connellsville, furnace, ovens	1.75	1.80	2.00	2.30
Connellsville foundry, ovens	2.50	2.65	2.75	3.25
Semifinished Material				
Sheet bars, open-hearth, Youngs.	26.00	26.00	26.00	28.25
Sheet bars, open-hearth, Pitts.	26.00	26.00	26.00	28.00
Billets, open-hearth, Pittsburgh	26.00	26.00	26.00	29.00
Wire rods, Pittsburgh	37.00	37.00	37.00	35.00

*1.75-2.25 silicon. For local delivery. Northern shipments based on $10, Birmingham. **2.25-2.75 silicon.

Delivered pig iron prices subject to 10 per cent freight surcharge, maximum 13.44c per gross ton, beginning Jan. 4, 1932.

	Dec. 3, 1932	Nov. 1932	Sept. 1932	Dec. 1931
Finished Material				
Steel bars, Pittsburgh	1.60	1.60	1.60	1.60
Steel bars, Chicago	1.70	1.70	1.70	1.60
Steel bars, Philadelphia	1.91	1.91	1.91	1.89
Iron bars, Chicago	1.65	1.65	1.65	1.60
Shapes, Pittsburgh	1.60	1.60	1.60	1.50
Shapes, Philadelphia	1.75	1.75	1.75	1.695
Shapes, Chicago	1.70	1.70	1.70	1.60
Tank plates, Pittsburgh	1.60	1.60	1.60	1.50
Tank plates, Philadelphia	1.74½	1.77	1.79½	1.735
Tank plates, Chicago	1.70	1.70	1.70	1.60
Sheets, No. 10 blue anneal., Pitts.	1.70	1.70	1.70	1.85
Sheets, No. 24, hot ann., Pitts.	2.10	2.10	2.10	2.40
Sheets, No. 24 galvan., Pitts.	2.85	2.85	2.75	2.90
Sheets, No. 10 blue anneal., Chi.	1.85	1.85	1.85	2.00
Sheets, No. 24 hot ann., Chi.	2.25	2.25	2.25	2.55
Sheets, No. 24 galvan., Chi.	2.90	2.90	2.90	3.05
Plain wire, Pittsburgh	2.20	2.20	2.20	2.20
Wire nails, Pittsburgh	1.95	1.95	1.95	1.95
Tin plate, per base box, Pitts.	4.25	4.50	4.75	4.75
Scrap				
Heavy melting steel, Pitts.	$9.00	9.15	9.50	10.25
Heavy melting steel, eastern Pa.	7.00	7.25	7.25	7.60
Heavy melting steel, Chicago	5.75	5.60	5.75	7.50
No. 1 wrought, eastern Pa.	7.00	7.25	7.25	9.50
No. 1 wrought, Chicago	5.25	5.00	5.00	7.45
Rails for rolling, Chicago	8.25	8.25	7.00	10.00

Sheets

Automotive Requirements Sustain Northern Ohio Mill Operations—Quieter Tone in Market

SHEET PRICES, PAGE 43

Pittsburgh—A few inquiries have been followed by several minor orders for first quarter. Prices of hot and cold rolled sheets announced recently applied. Specifications declined last week, mainly in the common grades. Orders for full-finished sheets are still at a low point. Black sheets are quoted 2.10c to 2.20c; galvanized, 2.85c; cold rolled 2.00c for heavy, and 2.50c for light. No. 10 hot rolled continue 1.55c. Follansbee Bros. Co. Inc. added 100 men to its mill force at Follansbee, W. Va., last week.

Boston—Demand for sheets is dull. Prices are unsettled, despite efforts by most mills to stabilize the market.

Philadelphia—Substantial improvement in demand for autobody sheets is expected by the middle of this month. While some sellers have not opened books for first quarter, indications are they will follow others who have advanced No. 24 hot annealed $2 a ton.

New York—Bids have been opened on approximately 1000 tons of cold finished sheets for license tags for New Jersey. The state took bids on plain material as well as on rounded blanks. The Edward G. Budd Mfg. Co., Philadelphia, was low on the blanks; announcement has not been made as to the plain material alternate. Action on 1400 tons of tag stock for New York, on which Sharon Steel Hoop Co. was low, is expected soon. General buying is quiet, with prices unchanged.

Youngstown, O. — Youngstown Sheet & Tube Co. is low on 163 tons of corrugated galvanized steel sheets, 27½ inches wide, for the navy, bidding $9727.25 for delivery to Boston, New York or Philadelphia; $8996, f.o.b. works, and $10,861.50 for delivery to Los Angeles, San Francisco or Seattle. Included in the lot are 6595 sheets 96 inches long, and 3992 sheets 120 inches long. Bids closed Nov. 29.

Cleveland—Releases of automotive sheets have been sustained much better than expected, and continue mill operations here around 35 per cent. However, no new orders have been placed here, though it is understood that Olds has distributed a moderate tonnage to various mills, through Detroit. Demand from manufacturers of household equipment has been reduced, and some mills expect less tonnage from this source this winter than a year ago, due to the fact manufacturers have large stocks. Stocks of electric refrigerators are estimated at more than 230,000. Sheet sellers examining the plans for the Cleveland postoffice note that aluminum has been specified for a large portion of the inside trim as well as the outside decorations. Award of the sheet steel for trim and ducts is expected shortly. Current prices on practically all grades of sheets now have been reaffirmed for first quarter by all producers, the single exception being 2.20c to 2.30c for black, up $2 a ton.

Cincinnati—The advance in hot rolled annealed sheets for first quarter has tended to strengthen other prices. Demand is light.

Chicago—Sheet buyers are restricting orders to immediate needs and individual lots are smaller. Some larger tonnages are in prospect, although mill operations are not expected to expand materially during December above the recent 15 per cent rate. Forward inquiry is lacking. Producers expect to continue present prices with the exception of an advance of $2 a ton on hot rolled annealed sheets.

St. Louis—Sheet sales are lower. Specifications from automobile builders and railroad car shops are light. Moderate improvement is reported in demand for galvanized.

CURRENT FINISHED STEEL PRICES

Delivered prices subject to freight surcharge corrected to nearest ½c. Asterisk denotes price change this week

Steel Sheets

HOT ROLLED No. 10
(24 to 48 inches wide)

Pittsburgh, base	1.55c
Gary, Ind. Harbor, base	1.65c
Chicago, delivered	1.70c
New York, delivered	1.90c
Birmingham, base	1.70c
Philadelphia, delivered	1.86c

BLUE ANNEALED NO. 9-10

Pittsburgh, base	1.70c
Chicago, district mills	1.80c
Chicago, delivered	1.85c
Philadelphia, delivered	2.01c
New York, delivered	2.05c
St. Louis, delivered	2.04c
Birmingham, base	1.85c
San Francisco c.i.f.	2.32½c

HOT ROLLED ANNEALED NO. 24

Pittsburgh, base	2.10c to 2.20c
Gary, Ind. Harbor, base	2.20c to 2.30c
Chicago, delivered	2.25c to 2.35c
New York, delivered	2.45c to 2.55c
Philadelphia, del.	2.41c to 2.51c
Birmingham, base	2.35c
St. Louis, delivered	2.54c
San Francisco, c.i.f.	2.85c
Detroit, delivered	2.28½c

GALVANIZED NO. 24

Pittsburgh, base	2.85c
Gary, Ind. Harbor, base	2.95c
Chicago, delivered	3.00c
Philadelphia, delivered	3.16c
New York, delivered	3.20c
Birmingham, base	3.00c
St. Louis, delivered	3.19c
San Francisco, c.i.f.	3.50c

AUTOBODY NO. 20

Pittsburgh, base	2.55c to 2.65c

FURNITURE

Pittsburgh, No. 10 heavy	2.40c to 2.50c
Pittsburgh, No. 20 light	2.90c to 3.00c

TIN MILL BLACK NO. 28

Pittsburgh, base	2.30c
Gary, base	2.40c
St. Louis, delivered	2.67½c

HEAVY COLD ROLLED NO. 10

Pittsburgh, base	2.00c
Gary, Ind. Harbor, base	2.10c
Chicago, delivered	2.15c
Philadelphia, delivered	2.31c
New York, delivered	2.35c

COLD ROLLED NO. 20

Pittsburgh, base	2.50c
Gary, Ind. Harbor, base	2.60c
Chicago, delivered	2.65c
Philadelphia, delivered	2.81c
New York, delivered	2.85c

Wire Products

(Prices apply on straight carloads. Mixed and joint carloads take 10 cents higher price; pool carloads 25-cent advance; less carloads 40-cent advance.)

F.o.b. mills, 100 lb. keg

Standard wire nails	$1.95
Cement coated nails	1.95
Galvanized nails	3.95

(Per pound)

*Polished staples	2.65c
*Galvanized staples	2.90c
Barbed wire, gal.	2.60c
Annealed fence wire	2.35c
Galvanized wire	2.80c
Woven wire fencing (9-11 gage)	$55.00
(12½ gage and lighter)	$60.00

(To Manufacturing Trade)

Plain wire, 6-9 gage	2.20c
Spring wire	3.20c

Chicago and Anderson, Ind., $1 over Pitts.-Cleve.; Duluth and Worcester, $2 higher; Fairfield, Ala., $3 higher.

Steel Plates

Pittsburgh, base	1.60c
Philadelphia, del.	1.69½c to 1.79½c
New York, delivered	1.80c to 1.90c
Boston, delivered	1.92c to 2.02c
Buffalo, delivered	1.85½c
Chicago, base	1.70c
Cleveland, delivered	1.78½c
Birmingham, Ala. base	1.75c
*Coatesville, Pa., base	1.60c to 1.70c
Pacific Coast, c.i.f.	2.00c
St. Louis, delivered	1.94c

Structural Shapes

Pittsburgh, base	1.50c to 1.60c
Philadelphia, delivered	1.75c
New York, delivered	1.87c
Boston, delivered	2.00½c
Chicago, base	1.70c
Cleveland, delivered	1.78½c
Lackawanna, N. Y., base	1.70c
Birmingham, Ala., base	1.75c
Pacific Coast, c.i.f.	2.10c
Do., wide flange	2.20c

Bars

SOFT STEEL

Pittsburgh, base	1.60c
Chicago, base	1.70c
Birmingham, Ala., base	1.75c
Lackawanna, N. Y., base	1.70c
Pacific Coast, c.i.f.	2.00c
Cleveland, base	1.65c
Philadelphia, delivered	1.91c
New York, delivered	1.95c
Boston, delivered	2.02c
Pittsburgh, cold finish	1.75c
Pittsburgh, forg. qual.	1.85c
San Francisco, c.i.f.	2.10c

RAIL STEEL

Chicago Heights	1.50c
Eastern mills	1.35c

IRON

Chicago, base	1.60c to 1.65c
New York, delivered	1.85c to 1.90c
Philadelphia, delivered	1.81c to 1.86c
Pittsburgh, refined	2.70c to 4.20c

REINFORCING

Pitts., billet cut lengths	1.75c
Pitts., stock lengths, mill	1.60c
Chicago, billet	1.50c to 1.60c
Chicago, rail steel	1.20c to 1.30c
Philadelphia, cut lengths	1.86c
Cleveland, cut lengths	1.75c

Cold-Finished Bars, Shafting

Base, Pittsburgh

10,000 to 19,999 pounds	1.70c
20,000 to 59,999 pounds	1.65c
60,000 to 99,999 pounds	1.60c
100,000 pounds and over	1.57½c

Chicago, Cleveland, Buffalo 5c higher; Detroit, 20c; eastern Michigan 25c

Corrosion, Heat Resist. Alloys

Base, Pittsburgh

18 per cent chrome, 8 per cent nickel Sheets, 35c; plates, 31c; bars, 28c.

	A	B	C	D
Bars	19c	20.5c	23c	28c
Plates	21c	22.5c	25c	30c
Sheets	26c	27.5c	30c	35c
Hot Strip	19c	20.5c	23c	28c
Cold Strip	25c	26.5c	29c	34c

Carbon 0.12 and under; no nickel. A has chrome 15% and under. B over 15/18% inc., C over 18/23% inc., D over 23/30%.

Tin and Terne Plate

Per 100-pound box, Pittsburgh

Tin plate, coke base, cont.	$4.25
Tin plate, coke base, stock	3.75
Long ternes, 24, unassorted	2.80

Gary, Ind., base 10 cents higher

Alloy Steel

Hot Rolled—F.o.b. Pittsburgh, Buffalo, Chicago and Massillon, O.

Hot rolled; base 2.45c to 2.65c, mills; differentials to various consumers

S.A.E.	Alloy Diff.	4600 .20 to .30 Mo. 1.25-1.75 Ni.	1.05
2000	0.25	5100 .80 - 1.10	
2100	0.55	Cr.	0.45
2300	1.50	5100 Cr.	
2500	2.25	spring	0.20
3100	0.55	6100 bars	1.20
3200	1.35	6100 Spring	0.95
3300	3.30	Cr., Ni., Van.	1.50
3400	3.20	Carbon van	0.95
4100 .15 to .25 Mo.	0.50	9250 (flats)	0.25
		9250 (rds., sq.)	0.50

Strip, Hoops, Bands

Hot-rolled strip up to 23 15/16 in. wide Pitts.	1.45c
Do., Chicago	1.55c
Do., del. Philadelphia	1.76c to 1.81c
Do., del. New York	1.80c to 1.85c
Cooperage hoop, Pitts.	1.55c to 1.60c
Do., Chicago	1.65c to 1.70c
Cold-roll. strip, Pitts., Cleve.	2.00c
*Worcester, 3 tons over	2.10c

Rivets, Wrought Washers

Struc., c.l., Pitts-Cleve.	2.25c
Struc., c.l., Chicago	2.35c
7/16-in. and smaller, Pitts., Chicago, Cleveland	70, 10 and 5 off
Washers, c.l., Pitts. dist.	$6.50 to 6.75 off
Do., Chicago district	7.00 to 7.50 off

Rails, Track Material

Standard rails, mill	$40.00
Relay rails, Pitts, 20 to 45 lbs.	$21.00 to 23.00
50 to 75	18.00 to 20.00
80 to 100	23.00 to 25.00
Light rails, 25-45, mills	$30.00
Light rails, Chicago	$32.00
Angle bars, mills	2.55
Spikes, railroad, mills	2.40c
Spikes, boat, barge, Pitts.	2.65c
Track bolts, Chicago	3.50c
do., standard, jobbers	73 off list
Tie plates, Pitts.	$35.00
Tie plates, Chicago	$35.00

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chi. Discounts to legitimate jobbing or large consuming trade for full-case lots apply to May 10, 1930, lists.

CARRIAGE BOLTS

All sizes, cut thread ..... 75 off
Rolled thread ⅜ x 6 and smaller take 10 per cent lower list.
Eagle list ..... 75 off

MACHINE BOLTS

All sizes, cut thread, lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts without nuts ..... 75 off
Tire bolts ..... 60 and 10 off
Stove bolts, 77½, 25 and 10 off in pkgs.; 86 off in bulk.
Rolled thread machine bolts, ⅜ x 6 and smaller take 10 per cent lower list.

NUTS

Semifinished ..... 75 off

HEXAGON CAP SCREWS

Milled ..... 80-25 off
Upset 1 in. diam. and smaller 80-25-10 off

SQUARE HEAD SET SCREWS

Upset, 1 in. and smaller ..... 75-10-10 off
Headless set screws ..... 75-10 off
Upset, larger than 1 in. ..... 75-10 off

Cut Nails, Chain, Piling

Cut nails, c.l. Pittsburgh	$2.50
Do., less carloads, 5 kegs or over	$2.90
Less than 5 kegs	$3.05
Chain, BB, BBB, 9/16-1½ in.	33 1/3 off
Steel sheet piling, Pitts.	1.90c

Bars

Demand Tapering as Year Nears End—Needs of Various Users Are Below Usual Volume

BAR PRICES, PAGE 43

Chicago—Soft steel bar demand still is tapering downward, principally as a result of smaller specifications from miscellaneous consumers. Automotive orders are fairly steady and requirements of the farm implement industry are expected to improve moderately over the next several months. Demand from the latter is considerably below the usual volume for this period. Producers are expected to announce first quarter prices shortly, although no change is looked for from the present market of 1.70c, Chicago. Rail steel bars continue 1.50c.

Boston—Commercial steel bars are dull, practically all leading manufacturing consumers being out of the market, including bolt and nutmakers. Prices are unchanged at 1.60c, Pittsburgh. Forging and tool steel bars are also inactive.

New York—Commercial bars are unchanged at 1.60c, Pittsburgh, and common iron bars at 1.50c to 1.55c. Buying is dull.

Philadelphia—Some fair tonnages of steel bars are pending for ship work, the largest involving 500 tons for cruiser No. 39, on which bids are to be opened Dec. 14. Other tonnages are for the lighthouse tender HEMLOCK and a large ferryboat for the Virginia Ferry Corp., Norfolk, Va. Miscellaneous demand is negligible. Steel bars are easy at 1.60c, Pittsburgh, and common iron bars are 1.50c to 1.55c, Pittsburgh.

Pittsburgh—November bar specifications were slightly less for October. This change follows a successive three-month increase, begun in August. A leading automotive account has failed to specify up to expectations and miscellaneous customers see approaching dullness in December and are not anticipating their forward needs. The first quarter announcement on bars has not been made, but probably the present 1.60c market will continue. One bar mill in this district has been operating at a better rate recently on some automotive business, its increased production being the exception.

Cleveland—Steel bar tonnage booked by one interest here in the week was about double that in the week preceding, due to a moderate inflow of orders from forgers working on automotive business. Except for this, the market was quieter. Commercial steel bars have been reaffirmed for first quarter at 1.65c, base, Cleveland; commercial forging bars at 1.70c; and guaranteed quality forging bars at 1.80c.

Tin Plate Mill Rate Lower; Contracts Coming In

Tin Plate Prices, Page 43

Pittsburgh—Tin mill operations are at 35 per cent, against 40 per cent a week ago. One independent mill in this district is planning to close for about four weeks. Some contracts have been booked for 1933 and considerable more are expected this week. The price is $4.25 per base box.

New York—Contracting is getting under way, with the base price holding at the new level of $4.25, Pittsburgh.

Cold-Finished Orders Show Slight Decline.

Cold Finished Prices, Page 43

Pittsburgh — A first quarter stand on cold-finished bar prices is likely to be taken daily, every indication pointing to a continuation of the present 1.70c minimum market for 5 to 10-ton lots to one destination at a time. November's cold bar specifications eased off from October. Automotive specifications, mainly those of a leading account, have been disappointing the past week.

Alloy Prices Extended

Alloy Steel Prices, Page 43

Hot rolled alloy steel prices have been reaffirmed for first quarter at 2.45c to 2.65c, base, mills. Inquiries are expected shortly from some of the more important consumers. Volume in the past week was slightly lower than in the preceding week. Producers are waiting the effect new automobile models will have on the public at the coming automobile shows, for a forecast on probable first quarter business. Demand from other sources is extremely light.

Plates

Requirements Developing for Brewery Tanks—Six Additional Cruisers Expected Within Year

PLATE PRICES, PAGE 43

Philadelphia—At least 1500 tons of steel, including several hundred tons of plates, will be required for a ferryboat for the Virginia Ferry Corp., Norfolk, Va. The largest ship job pending is cruiser No. 39, on which, as noted recently, bids will be opened Dec. 14. This vessel will take approximately 3500 tons of hull steel, 1800 tons of special armor plate, 1500 tons of shapes and 500 tons of bars; total, 7300 tons. The cruiser likely will be succeeded by six more within 12 or 14 months, according to present schedules. With Peter & A. J. Ellis, Philadelphia, low for the general contract, indications are that the 48-inch pipe for the District of Columbia water commission will be made of steel plates. Prices are fairly steady at 1.60c to 1.70c, Coatesville, on car lots.

Boston—Plate buying has fallen off. Small tank builders are taking less material, but New England railroads are taking more for repairs. Several large tanks are being figured in Maine. Boiler shops are doing little. Prices are inclined to be easy.

Pittsburgh — Extension of the present price of 1.60c, Pittsburgh, is expected for first quarter. Lack of forward contracting continues noticeable. District mills report no outstanding plate orders, and tank fabricators report jobs are infrequent.

Cleveland—Considerable figuring is being done on beer storage tanks, 10 feet or more in diameter, requiring plates about ¼-inch thick. A fabricator obtaining plate prices here is said to have $1,000,000 worth of tank business for breweries, contingent upon the legalizing of beer. These tanks are built up in sections, and have special heads. Some fabricators are understood to be contemplating dispensing with glass liners and using a composition coating similar to that used on the inside of wood beer vats. Actual business in plates appears at the lowest point of the

year; many consumers are postponing orders until January. A few makers have opened books for first quarter at an unchanged price of 1.60c, base, Pittsburgh, but say no inquiries have appeared for that period.

New York—Oil requirements are outstanding in a generally quiet plate market. Prices are unchanged at 1.60c to 1.70c, base, Coatesville, Pa. Consumers show little interest beyond immediate requirements.

Chicago—Plates continue to move slowly to all leading users. Pending tank work is slow to be closed and car repair work at railroad shops lacks improvement. A few line pipe projects are in prospect, although action on several is expected to be deferred for several months. Plates continue 1.70c, Chicago, with announcement of the first-quarter price deferred.

Contracts Placed

115 tons, tank, Quincy, Fla., to R. D. Cole Mfg. Co., Newnan, Ga.

Unstated tonnage, 14 bell and whistle buoys, lighthouse bureau Staten Island, N. Y., to William B. Pollock Co., Youngstown, O.; total bid $7320, f.o.b. Youngstown.

Contracts Pending

450 tons, lighthouse tender HEMLOCK; Berg Shipbuilding Co., Seattle, low; delivery to Seattle.

250 tons, brewery repairs and expansion, Boston.

110 tons, 300,000-gallon standpipe, state school, Napanoch, N. Y.; bids being taken.

100 tons, stand pipe, Hamilton field, San Rafael, Calif.; bids Dec. 16.

Nut, Bolt Prices for First Quarter Unchanged

Bolts, Nuts, Rivets Prices, Page 43

Chicago—First quarter contracts for bolts, nuts and rivets are to be issued within a few days with prices unchanged at 75 off for bolts and nuts and 2.35c for large rivets. Business recently has been unimproved and the November volume was slightly below that of October. A small gain is noted in specifications from farm implement manufacturers.

Pittsburgh—Bolt and nut prices for first quarter have been reaffirmed with 75 off list on bolts and 2.25c, Pittsburgh, on rivets. No genuine test of the market for the first quarter has been made as few contracts have been returned. Customers' specifications in November were on the whole comparable with those of October. Orders for car repair work were prominent.

Railroads

Rail and Car Inquiry Slow to Develop — Recent Reductions Fail to Stimulate Orders

TRACK MATERIAL PRICES, PAGE 43

New York—With domestic freight car buying negligible in November, the total for the first 11 months is 1689 cars, compared with 9683 in the corresponding period last year, 42,417 in 1930 and 96,395 in 1929. Further comparisons:

	1932	1931	1930	1929
Jan.	159	100	5,072	13,196
Feb.	35	50	17,027	15,944
March	105	2,166	6,118	12,023
April	0	2,798	1,997	8,205
May	60	20	1,392	7,562
June	0	1,910	998	5,886
July	25	617	1,389	341
Aug.	5	1,304	1,111	2,854
Sept.	1,298	703	576	4,517
Oct.	0	980	4,116	19,506
Nov.	2	35	2,621	6,361
11 mo.	1,689	9,683	42,417	96,395
Dec.	.....	11	2,729	9,710
Total	.....	10,694	45,146	106,105

While car buying is negligible there is a fair business in spare parts. One car builder is considering construction of 100 tank cars for stock. Ferrocarril al Pacifico De Costa has awarded 50 box cars to the Gregg Co. Ltd. for construction at Gregg's Belgian plant.

Pittsburgh—Reductions in price of rails and standard rail fastenings of over a month ago are having no effect on buying. Leading railroads are slow to anticipate 1933 requirements, and budgets in several cases have been put aside for later consideration. There appears to be no prospect of standard rail buying in spite of the fact that many roads did not even specify against all of their 1931 contracts, let alone make commitments in 1932. Nominal markets continue, large railroad spikes quoted at 2.40c, mill, tie plates, 1.75c, angle bars 2.55c, and standard open-hearth rails $40 per ton.

Cleveland—Releases for small quantities of track fastenings are received occasionally. Orders for car repair material are lighter. No buying of consequence is anticipated this month.

Chicago—Releases against orders for rails and fastenings are fairly steady, while new business is in light and unchanged volume. Rail inquiries are lacking, but small releases permit limited operations by the two producers in this district. Orders for miscellaneous steel products for car repair work are unimproved and new freight car inquiry has yet to appear. Action is deferred on what little equipment is pending in the market.

Car Orders Placed

Lehigh & New England, conversion of 20 hoppers to cement cars in own shops.

Car Orders Pending

American Car & Foundry Co., may build 100 tank cars.

Wire Loses Headway as Seasonal Factors Rule

Wire Prices, Page 43

Chicago—Wire shipments are declining seasonally. November business was smaller than that of the two preceding months, but slightly above the low level of summer. Demand from farm districts continues dull, and while requirements of some manufacturers' wire consumers are fairly steady, the tendency in orders from other users is downward. Producers have opened first quarter books at unchanged prices of $2, Chicago, for carload lots of wire nails and 2.25c for plain wire.

Worcester, Mass. — While there has been some decline in wire demand, one of the largest producers during November booked a volume ahead of last year, comparing favorably with October. Jobbers are buying little. Prices are unchanged and generally firm.

Philadelphia—Reaffirming of current prices on wire products for the first quarter is indicated here. Nails are $1.95, Pittsburgh, and plain bright wire 2.20c, Pittsburgh. Demand from jobbers continues to feature an otherwise quiet market.

Pittsburgh—Within the next few days wire mills will have announced the opening of contracting for first quarter on wire products. In all probability present prices will be reaffirmed with $1.95 the carload price for nails and 2.20c base, on plain wire.

Cleveland—Wire prices appear under some pressure, with some buyers offering orders at 2.10c, base, Cleveland, but makers holding for 2.20c. In one instance, a round tonnage was offered at the lower figure. Mills are reaffirming 2.20c for first quarter; and $1.95 for 100-pound kegs of standard wire nails.

Structural Shapes

Early Action Expected on a Number of Large Eastern Projects—Loan Assures 60,000 Tons for New Orleans Bridge—Low Material Prices Apparent in Bids

STRUCTURAL SHAPE PRICES, PAGE 43

New York—New structural steel requirements are developing slowly and awards are light. Several large jobs are nearing the active stage, but steel bids will not be out on the bulk of the work before the turn of the year. Bids are in on 1400 tons for New York state bridges. Shading of plain material prices is noted on a few large tonnages, while fabricated quotations continue irregular.

Boston—Bids are in on a Maine bridge taking 500 tons. Figures will be taken next month on a state span at Oxford, Mass., requiring several hundred tons. Private and commercial construction is at a standstill. Plain material is inclined to be easy.

Philadelphia—Early award of 8500 tons of structural steel is expected for the customs house here, for which McCloskey & Co., this city, have been awarded the general contract. Other jobs active include 2300 for the naval hospital, on which bids are to be opened Dec. 5; 2000 tons for the postoffice in Norfolk, Va., on which Consolidated Engineering Co., Baltimore, is general contractor. Supplemental bids on the appraisers' store at Baltimore, requiring 2300 tons, will be opened Dec. 14. Shapes are steady at 1.70c, nearest mill.

Washington—About 60,000 tons of structural steel is likely to be released soon as a consequence of approval by the interstate commerce commission of a loan of $6,000,000 from the Reconstruction Finance Corp., to New Orleans, for financing the Belt line bridge across the Mississippi river. Similar action by the finance corporation is expected. On bids taken a year ago, American Bridge Co., was low for 20,000 tons for the main span, and McClintic-Marshall Corp. low for 40,000 tons for the approaches.

Pittsburgh—Ingalls Iron Works Co., Verona, Pa., has booked 1600 tons for a powerhouse in Washington for the Potomac Electric Power Co.,Bridge work still is the most active in the market. Another state letting for Pennsylvania goes in Dec. 16. Plain material is nominal at 1.50c to 1.60c, Pittsburgh.

Cleveland—Negotiations still are in progress for the 11,500 tons of shapes, including about 2000 tons of silicon steel, for the Cleveland postoffice, the general contract for which has been awarded to Lundoff-Bicknell Co., Cleveland. Action is expected within a week. Steel awards on a number of state bridges recently contracted for still are hanging fire. While plain shapes officially are quoted 1.50c and 1.60c, base, Pittsburgh, fabricators say the market is demoralized and that figures in recent bids clearly indicate plain material prices of 1.30c to 1.40c, with fabricators' shop costs and overhead waived.

Chicago—A fairly large tonnage of structural steel is involved in pending work, while new inquiry is light. A Kansas City bridge requiring 1700 tons has been awarded. The market nominally is unchanged at 1.70c, Chicago, with mills following the lead of eastern producers in quoting plain material f.o.b., point of delivery to the job. Two thousand tons of piling has been placed for the Alma Wis., dam.

Contracts Placed

2000 tons, piling, lock and dam, Alma, Wis., to Kalman Steel Corp., Bethlehem, Pa.

1700 tons, Seventh street bridge, Kansas City, Mo., to Kansas City Bridge Co., Kansas City.

1600 tons, powerhouse for Potomac Electric Power Co., Washington, to Ingalls Iron Works Co., Verona, Pa.

925 tons, inspection shed and service building, city project, Jamaica, N. Y., to Lehigh Structural Steel Co., Allentown, Pa.; Woodcrest Construction Co., contractor. Award dependent on appropriation and final action on general contract.

675 tons, highway bridge, St. Francis river, Ark., to Wisconsin Bridge & Iron Co., Milwaukee.

575 tons, highway bridge, Tuscumbia, Mo., to Stupp Bros. Bridge & Iron Co., St. Louis.

450 tons, state highway bridge, Pulaski county, Missouri, to Stupp Bros. Bridge & Iron Co., St. Louis.

410 tons, bridges, Missouri Pacific railroad; 220 tons to Mississippi Valley Structural Steel Co., Decatur, Ill., 190 tons to McClintic-Marshall Corp., Bethlehem, Pa.

330 tons, Illinois bridges at Coulterville and Sesser, Ill., to McClintic-Marshall Corp., Bethlehem, Pa.

300 tons, immigrant station, Honolulu, T. H., to J. L. Young Engineering Co., Honolulu.

300 tons, miscellaneous repairs to bridges for Pennsylvania, to Shippers' Car Line Inc., Milton, Pa.; this is in addition to 240 tons noted last week as placed with this fabricator.

260 tons, bridge, Eugene, Mo., to Stupp Bros. Bridge & Iron Co., St. Louis.

256 tons, shapes and bar joists, high school, Hannibal, Mo., 150 tons of former to Dildine Bridge & Iron Co., Hannibal; 106 tons of joists to Laclede Steel Co., St. Louis, Busboom & Rauh, Kansas City, Mo., general contractors. Truscon Steel Co., Youngstown, O., awarded 65 tons of reinforcing bars.

225 tons, highway bridges, Oklahoma, to Missouri Valley Bridge & Iron Co., Leavenworth, Kans.

200 tons, postoffices at Vallejo and Napa, Calif., 120 and 80 tons respectively, to Bethlehem Fabricators Inc., Bethlehem, Pa.

175 tons, bridge, Henry county, Missouri, to St. Joseph Structural Steel Co., St. Joseph, Mo.

150 tons, bridges, Tieton river, National Forest park, Washington, to Poole & McGonigle Inc., Portland, Oreg.; through Sedgewick Construction Co., Portland, Oreg.

145 tons, overpass, Fort Worth, Tex., to Virginia Bridge & Iron Co., Roanoke, Va.

143 tons, sheet piling for Alaska railroad, to Bethlehem Steel Corp., Bethlehem, Pa.

118 tons, state viaduct and approaches, Salt Lake county, Utah, to Minneapolis-Moline Power Implement Co., Minneapolis; T. G. Rowland, Salt Lake City, contractor. Colorado Fuel & Iron Co., Denver, awarded 52 tons of reinforcing bars.

110 tons, shapes and bars, bridge, Sheridan county, Wyoming, to American Bridge Co., Pittsburgh, and Sheridan Iron Works, Sheridan, Wyo.; through R. C. Evans.

101 tons, 65 shapes, 36 bars, addition, Foxhall school, Washington, to Barber & Ross, Washington, and Capitol Fireproof Co., Rosslyn, Va.; A. Lloyd Goode Inc., Charlotte, N. C., general contractor.

100 tons, approximately, steel piling for Florence Pipe & Foundry Co., Florence, N. J., awarded through J. H. Terry & Co., Philadelphia, to Kalman Steel Corp., Bethlehem, Pa.

100 tons, postoffice, Billings, Mont., to American Bridge Co., Pittsburgh, W. D. Lovell, Minneapolis, contractor. Cowin & Co., Minneapolis, awarded 44 tons of reinforcing bars.

100 tons, bridge, Kennebunk, Me., to American Bridge Co., Pittsburgh.

Unstated, postoffice, St. John's, Oreg., to Pacific Iron Works, Portland, Oreg.

Awards Compared

	Tons
Awards, week ended Dec. 3	**11,448**
Awards, week ended Nov. 26	**8,494**
Awards, week ended Nov. 19	**20,393**
Awards, this week in 1931	**19,047**
Av. weekly awards, 1931	**34,236**
Av. weekly awards, 1932	**16,100**
Av. weekly awards, Nov.	**11,468**
Awards, to date, 1931	**1,706,168**
Awards to date, 1932	**788,913**

Contracts Pending

60,000 tons, public bridge across Mississippi river at New Orleans, La. Loan

of $6,000,000 by Reconstruction Finance Corp., approved by interstate commerce commission. On bids taken year ago American Bridge Co., Pittsburgh, was low for 20,000 tons for main span; McClintic-Marshall Corp., Bethlehem, Pa., low for 40,000 tons for approaches.

8500 tons, United States customs house, Philadelphia; McCloskey & Co., that city, awarded general contract.

8000 tons, Archives building, Washington; George A. Fuller Co., New York, awarded general contract.

2400 tons, Halsted street bridge, Chicago; Mt. Vernon Bridge Co., Mt. Vernon, O., low.

1500 tons, central heating plant, Washington; Rust Engineering Co., Pittsburgh, low.

1500 tons, naval hospital, Philadelphia.

1000 tons, highway bridges, Missouri.

900 tons, Knights Landing bridge, Sacramento, Calif.; bids being taken.

800 tons, bridge, Idaho.

750 tons, bridge, Holly, Colo.

650 tons, toll bridge, Tampa-Clearwater Bridge Co., Tampa, Fla.; tonnage previously reported as 200 tons, revised.

634 tons, Bonner Ferry bridge in Idaho; bids Dec. 1.

600 tons, bridge, Falworth, Me.; Lackawanna Steel Construction Corp., Buffalo, low.

543 tons, state bridges, Okfuskee county, Oklahoma; bids Dec. 6.

420 tons, municipal building, Cambridge, Mass.; J. M. & C. J. Buckley, contractors.

400 tons, state building, Saratoga, N. Y.

345 tons, bridge, Monroe county, Michigan.

325 tons, addition, postoffice, Jersey City, N. J.; former bids rejected, readvertised closing Dec. 20.

300 tons, viaduct, Thirtieth street, Philadelphia; specifications to be issued by the city, with the Pennsylvania railroad sharing the expense.

300 tons, shapes and bars, postoffice, New London, Conn.; Andrew Christensen, Elizbeth, N. J., low.

300 tons, including plates, two rolling lock gates, Cincinnati engineers; bids Dec. 20.

300 tons, postoffice, Columbus, Ga.; Murch Bros. Construction Co., St. Louis, low.

285 tons, postoffice, Alexandria, La.; Algernon Blair, Montgomery, Ala., awarded general contract; supplemental bids Oct. 27.

250 tons, state bridge, Clinton county, Pennsylvania; bids opened Dec. 2.

250 tons, building, American Oil Co., Gray's avenue, Philadelphia; original specifications which called for approximately 100 tons, revised and new bids asked.

250 ons, boiler house and factory addition, Collins & Aikman, Philadelphia, bids asked.

225 tons, bridge, Pennsylvania railroad, Camden, N. J.

190 tons, fire station, Cambridge, Mass.; J. B. Dolan, general contractor.

189 tons, 435-foot truss bridge, Clarion and Armstrong counties, Pennsylvania, for state highway department; bids at Harrisburg, Pa., Dec. 16.

100 tons, fire station, Boston; M. S. Kelliher Co., Boston contractor.

100 tons, shapes and bars, postoffice, Bryn Mawr, Pa.; Gondas Co., Atlantic City, N. J., low.

100 tons, postoffice, Catskill, N. Y.

100 tons, postoffice, Redlands, Calif.; bids Dec. 30.

Unstated tonnage, terminal building, Boston and East Boston traffic tunnel.

Concrete Bars

Market Reflects Seasonal Slowing of Bridge and Highway Work—General Contracts Awarded on Several Substantial Building Jobs in Eastern Territory

REINFORCING BAR PRICES, PAGE 43

Chicago—Several fairly large reinforcing bar contracts are pending, including several thousand tons for Illinois and Indiana road work, while 600 tons will be required for waterworks construction at Springfield, Ill. Awarads are limited principally to small lots for federal buildings.

Boston—Close to 1000 tons will be required for a metropolitan waterworks project at Enfield, Mass., bids closing next week. This is the largest reinforcing bar tonnage in months.

New York—Concrete bar awards generally are small. The larger tonnages bring out price concessions. Two Massachusetts contractors are buying about 375 tons of highway mesh and bars for New York state highway and bridge work.

Philadelphia—Immediate placing of 1500 tons of concrete bars and steel mesh for the Thirtieth street postoffice here is expected. Wallin Co. Inc., 103 Park avenue, New York, having been awaraded the subcontract. Several other substantial contracts are up for figures. Billet steel, cut lengths, continues easy at 1.45c to 1.55c, Pittsburgh.

Pittsburgh — General Contracting Corp., Pittsburgh, is contractor on a bid of $92,317 for the Negley run sewer extension here, requiring approximately 200 tons of bars. A firmer stand is being taken on reinforcing steel bars, but competitive factors still result in an easy 1.60c market.

Cleveland—Highway Construction Co., Cleveland, expects to place 1365 tons for the Brook Park village, Cuyahoga county, O., bridge this week. For the state bridge at Wakeman, O., 169 tons have been placed with the Joseph T. Ryerson & Son Co. Inc.

Awards Compared

	Tons
Awards, week ended Dec. 3	2,027
Awards, week ended Nov. 26	2,239
Awards, week ended Nov. 19	2,669
Awards, this week, 1931	6,120
Av. weekly awards, 1931	6,808
Av. weekly awards, 1932	4,056
Av. weekly awards, Nov.	2,236
Awards, to date, 1931 346,329	
Awards to date, 1932 198,285	

Contracts Placed

450 tons, barrack buildings, Barksdale field, Shreveport, La., to Austin Bros., Dallas, Tex.; Worsham Bros., Knoxville, Tenn., general contractor.

250 tons, veterans' hospital buildings, Cheyenne, Wyo., to Colorado Builders Supply Co., Denver; through Henry B. Ryan Co., Chicago, general contractor.

200 tons, postoffice, Lansing, Mich., to Capital Tool & Engineering Co., Lansing.

169 tons, state bridge, Wakeman, O., to Joseph T. Ryerson & Son Co., Inc., Cleveland; through Hecker-Moon Co., Cleveland, gneral contractor.

166 tons, hospital buildings, Barksdale field, Shreveport, La., to Laclede Steel Co., St. Louis; through Henry B. Ryan Co., Chicago, general contractor.

150 tons, foundations only, postoffice, Albany, N. Y., to Igoe Bros., Newark, N. J.; Kenny Bros., New York, general contractors.

115 tons, completion of dirigible base hangar, Sunnyvale, Calif.; to Concrete Engineering Co., San Francisco.

115 tons, approach, Porter street tunnel portal, East Boston, Mass., to Barker Steel Co., Boston; A. G. Tomasello & Son Inc., Boston, contractor.

112 tons, and more, including 1000 squares' reinforcing fabric, United States engineer, New Orleans, La., to American Steel & Wire Co., Chicago; approximately 75 tons, West Point, N. Y., to Concrete Steel Co., New York; and 37 tons, 1-inch, for United States engineer, Vicksburg, Miss., to Joseph T. Ryerson & Son Inc., Chicago.

105 tons, postoffice, Alexandria, La., to Southern General Fireproof Co., Atlanta, Ga.; Algernon Blair, Montgomery, Ala., general contractor.

100 tons, or more, bars and shapes, concourse, baggage and mail buildings, union station, Dayton, O.; bars to Dayton Buildings Supply Co., and shapes to John G. Pool Co., Dayton; H. R. Blagg Co., Dayton, general contractor.

100 tons, school, Malverne, N. Y., and hospital, Huntington, N. Y., to Joseph T. Ryerson & Son Co. Inc., New York.

Unstated postoffice, St. John's, Oreg., to Mercer Steel Co., Portland, Oreg.

Contracts Pending

1500 tons, bars and mesh, Thirtieth street postoffice, Philadelphia, early action expected through Wallin Co. Inc., 103 Park avenue, New York, subcontractor.

1000 tons, caisson, metropolitan water district commission, Enfield, Mass.

650 tons, customs house, Philadelphia;

McCloskey & Co., that city, awarded general contract.

600 tons, waterworks construction, Springfield, Ill.

400 tons, state road work near Freehold, N. J.; general contract bids to be opened Dec. 7.

375 tons, state highways, New York; to be placed by Massachusetts general contractors, Perini Co., and Warren Roads Construction Co.

300 tons, state road work, Pennsylvania, general contract bids opened Dec. 2; additional tonnage required for road work on which bids will be opened Dec. 16.

200 tons, bridges, Franklinville,N. Y., highway project; bids Dec. 6.

200 tons, extension of Negley run sewer, Pittsburgh; General Contracting Corp., Pittsburgh, contractor at $92,-317.

185 tons, Best Foods store, San Francisco; general contract awarded to Larsen & Larsen, San Francisco.

153 tons, Baltimore & Ohio railroad grade crossing, Staten Island, N. Y.

120 tons, state highway work in San Joaquin county, California; bids Dec. 19.

110 tons, postoffice, Redlands, Calif.; bids Dec. 30.

Mirrors of Motordom

(*Concluded from Page* 15)

member probably registered some improvement. The gain was not as great as expected, owing to the tendency to delay assemblies of new models. The outlook is that December will develop a greater increase over November than November did over October.

Chevrolet is about to overtake Plymouth as the premier producer. Plymouth continues at 1200 units daily, five days a week, but Chevrolet has a schedule calling for about 50,000 units in December, which on the basis of a 6-day week entails a daily rate of about 2000 units.

Buick having assembled the greater portion of the 7000 cars needed for "sampling" its dealers, operations have been reduced, in some departments down to two days a week. Olds, shortly to begin assembling, has released steel for 15,000 units. Dodge the past few days released parts for an additional 4000 of the new six.

Hupp is continuing its eight with few body and mechanical changes. The Hupp six also will be little changed mechanically, but the body has been redesigned along the general lines of the eight. Some parts have been released, and a few cars are being assembled for adjustment of the assembly line. Incidentally, Hupp as well as Franklin has been using a tubular front axle, which is an innovation of the new Plymouth six.

The revised Lincoln line will include a medium as well as a high price twelve.

Pipe

Government Loans Facilitating Many Projects—Eastern Utilities Inquiring for Tonnages

PIPE PRICES, PAGE 56

Chicago—Columbia, Ill., has been granted a loan by the Reconstruction Finance Corp., permitting improvements to the water suply system, for which 500 tons of cast iron pipe was ordered early this year. Other loans for smaller lots of pipe have been granted to Hopkinsville, Ky., Blackstone, Va., and Valdese, N. C. Awarding of 800 tons for the Wilmette, Ill., water system is deferred pending an injunction hearing. Activity elsewhere is extremely dull and few projects are noted among awards or inquiries.

Boston—The New England pipe foundry has booked about 225 tons for a Maine water district. About 6000 feet of 10-inch cast pipe also has been purchased by a municipality. Buying in general is light and prices on this small volume are firm. Boston is expected to be in the market for a good tonnage this month.

New York—Several gas and utility companies are entering the market for partial requirements for 1933. Included in the list is the Consolidated Gas Co., inquiring for several hundred tons of cast pipe. A few small lots for Westchester county, New York, are being bought, also several hundred tons for New York state highway work. Eastern pipe foundries generally are not operating at 30 per cent. Prices are firm at $30 to $32, foundry.

Two utility companies, including the Brooklyn Union Gas Co., are inquiring for a total of approximately 2500 tons of miscellaneous sizes of steel pipe.

Pittsburgh—Standard pipe demand in November marked a second low for the year. It is doubtful if sales for some mills were lower in July.

Cleveland—Practically the sole output for pipe here is through jobbers. Volume has not improved, but orders are more numerous.

Loans authorized by the Reconstruction Finance Corp., in October, for financing water systems in various states amounted to $7,531,000; for sewer systems, $615,000; and for western irrigation projects, $7,260,-000. A large tonnage of steel and iron pipe will be required for these improvements.

Birmingham, Ala.—Pipe manufacturers here believe the bottom of the depression in their business has been reached, and that improvement is at hand. Government loans to municipalities are providing an incentive for spring construction.

Cast Pipe Placed

225 tons, water district, Kennebec, Me., to Warren Foundry & Pipe Co., Wharton, N. J.

125 tons, Essex Fells, N. J., to Donaldson Iron Works, Emaus, Pa. Previously reported as going to another eastern foundry.

100 tons, 6-inch class 150, Albuquerque, N. Mex., to unnamed interest.

100 tons, 3-inch and under, galvanized wrought iron or steel, Panama, to Mohawk Tube Co., Cohoes, N. Y.; also 3100 feet, 4-inch and under extra strong black wrought iron or steel, to L. R. Flori Co., St. Louis.

Cast Pipe Pending

1000 tons, 6, 8 and 12-inch, for New York; Donaldson Iron Co., Emaus, Pa., low on 490 tons; United States Pipe & Foundry Co., Birmingham, Ala., low on 340 tons; and Central Foundry Co., Birmingham, Ala., low on 170 tons; bids opened Dec. 2

482 tons, 6 to 18-inch class B, San Bruno, Calif.; bids Dec. 7.

400 tons, small sizes, Consolidated Gas Co., New York.

284 tons, 12 to 24-inch class B, Vernon, Calif.; National Cast Iron Pipe Co., Birmingham, Ala., low.

217 tons, 4 to 8-inch class B, Huntington Park, Calif.; bids rejected.

Unstated tonnage, 1400 feet of 6-inch, waterworks, Blackstone, Va. Reconstruction Finance Corp. will purchase $10,000 worth of bonds.

Steel Pipe Pending

Unstated tonnage, 10,000 feet, 3-inch galvanized wrought iron or steel, for Panama; Cornell & Underhill, New York, low at $3180; bids Nov. 29.

Larger Ore Shipments Assured for Next Year

Iron Ore Prices, Page 50

Cleveland—Substantial improvement in Lake Superior iron ore shipments next year is inevitable, in the opinion of leading producers here, following the season just closed, with lake shipments finally reported as 3,567,985 tons, lowest in 47 years. All companies with underground mines have made arrangements for operation of some properties this winter, and in the spring mining is expected to pick up considerably. No opinions as to the movement next year are yet ventured by the best informed, much depending upon consumption before spring.

Strip

Mills Near End of Backlogs—New Buying Sparing—Prices For First Quarter Unchanged

STRIP PRICES, PAGE 43

Pittsburgh — Consumers of strip bought more sparingly in November than during October. Strip mill operations in declining to around 12 to 15 per cent last week reflected the low rate of buying. Narrow hot-rolled sizes continue in best demand. Several inquiries for first quarter are out. The base of 1.45c is firm on hot-rolled. Cold-rolled is 2.00c.

Worcester, Mass.—A mild spurt in cold-rolled strip is being experienced by some sellers in New England, several stamping shops buying slightly more freely. Prices are fairly steady on cold-rolled at 2.10c, Worcester, base. Demand is for narrow widths.

New York—Buying of cold-rolled strip has further declined, reflecting principally lighter requirements for manufacturers of electrical devices. Prices are unchanged, however, at the recently reaffirmed price of 2.00c, Pittsburgh. Hot strip is 1.45c.

Philadelphia—Steel strip is moving slowly, with the reaffirmed prices of 1.45c and 2.00c, Pittsburgh, on hot and cold-rolled grades respectively.

Cleveland—Most of the material released by automotive interests in November has been rolled, and new orders have shrunk considerably. Some mills which shared liberally in automotive buying have booked nothing additional for the past two weeks. Local mill operations, now around 35 per cent, are tapering. No inquiries have appeared for first quarter, though prices have been reaffirmed at 1.45c to 1.50c, base, Pittsburgh, for hot-rolled, and 1.90c to 2.00c, base, Cleveland for cold-rolled.

Chicago—Strip demand is fairly steady, with hot mill operations continued at around 15 per cent. Some decrease in orders from miscellaneous users is offset partly by additional requirements from automotive interests. Strip producers are quoting 1.55c, Chicago, for hot strip and 2.00c, Pittsburgh-Cleveland, for cold strip for first quarter.

Operations Down to 16 Per Cent; Easing Into Holidays

Pittsburgh—Steel ingot operating rate in this district failed to register the anticipated expansion after the late November holiday and operations last week were unchanged at 16 per cent. A leading mill's rate is unimproved, its average being close to 15 per cent. Eight out of 53 steelworks blast furnaces are blowing, four being Carnegie Steel Co. furnaces, the other four independents.

Operations, week ended Dec. 3..	**16**
Operations, week ended Nov. 26	**17.5**
Operations, week ended Nov. 19	**19**
Operations, one year ago	**26**
High for 1932, Feb. 6	**28.5**
Low for 1932, July 9	**12**

Philadelphia—Eastern steelmaking operations continue around 13 per cent, with little variation expected.

Buffalo—From the peak of 27 per cent in the week ended Nov. 26, steelmaking operations fell precipitately to 14 per cent in the week ended Dec. 3, lowest since the first week of October. This is partially due to the close of navigation on the Great Lakes and four to five open hearths being dropped, leaving only five active. The present rate is expected to hold until the holidays, although two open hearths may be operated intermittently. Republic stopped production here Nov. 28. Bethlehem has dropped from seven open hearths to four; Wickwire continues with one.

Youngstown, O.—Steel production in the week ended Dec. 3 held unchanged at 16 per cent and was expected to hold there this week. Finishing mill operations are steady, reducing ingot stocks. It is believed that the decline in December will be less than was anticipated. Twenty of 83 open-hearth furnaces are active.

Cleveland—Steel ingot production here for the week ended Dec. 3 was at 30 per cent, down from 35 per cent in the preceding week. Otis Steel Co. dropped during the week from four to three active open hearths; Corrigan, McKinney Steel Co. continued with four, and American Steel & Wire Co., with three. The rate at the close of the week stood at 29 per cent, and though no change in the schedule was contemplated for the current week, the tendency is to taper.

Chicago—While ingot production increased at one mill the past week following the holiday suspension, lower schedules at other mills brought the average last week down to 14 per cent, with additional curtailment in prospect this week. Blast furnace operations held at eight active stacks out of 36, with schedules of most finishing mills unchanged.

Birmingham, Ala.—Steelmaking operations last week declined two and one-half points to 15 per cent, the lowest of the year, in direct step with demand.

Warehouse Selling Less In November; Prices Hold

Warehouse Prices, Page 56

Chicago—Sales are declining at about the usual seasonal rate and December is expected to continue the downward tendency. Warehouse prices are fairly steady and no changes are anticipated in quotations on material out of stock.

Boston—Warehouse volume of trade declined the last 10 days of November after holding at the October rate. Small orders were fairly numerous. Prices are unchanged.

Philadelphia — Warehouse trading is off slightly from a week ago, with the holiday season likely to have a further depressing effect over the remainder of this month.

Pittsburgh—November sales of steel products from stock held fairly close to the October volume, with only minor changes being reported.

Detroit—Warehouse business in iron and steel shows a moderate seasonal decline. There has been a little less buying by die and tool shops, as retooling for the manufacture of new automobile models has been completed. Warehouses have adopted a new price schedule on boiler tubes, whereby on 10,000 pounds and less the warehouse and the mill price is identical.

Cleveland—Warehouses have reduced prices of boiler tubes, following the recent readjustment in mill prices, passing along to consumers savings to warehouses through quantity purchases. Price schedules predicated upon quantities of less than 10,000 pounds have been issued. Discounts will be quoted on lots over 10,000 pounds.

Cincinnati — Jobbers report November business showed less than customary seasonal decline, with tonnage close to that moved in September. Prices are firm.

St. Louis—Iron and steel warehouse and jobbing interests here report November business as a whole the smallest for any month since last winter. Conditions are spotty.

RAW MATERIAL PRICES

Delivered pig iron prices subject to 10 per cent freight surcharge, maximum 13.44c gross ton, from Jan. 4

Asterisk denotes price change this week

Pig Iron

Per Gross Ton

FOUNDRY, NO. 2

Chicago, furnace	$15.50
Pittsburgh, dist. fur.	15.00
Pittsburgh, delivered	15.63 to 16.13
Valley furnace	14.50 to 15.00
Cleveland fur., local del.	15.00
Philadelphia, delivered	13.51 to 13.76
Virginia furnace	17.25
Granite City, Ill., fur.	16.50 to 17.50
Buffalo, fur., local del.	16.00
Buff., all-rail, Boston	18.91 to 19.91
Buff., all-rail, Brooklyn	18.90
Buff., all-rail, Newark	17.28
Ala., Bir. fur., local del.	11.00
Ala., Nor. del., Bir. base	10.00
Alabama, del. Chicago	16.01
Alabama, del. St. L.	14.42
Alabama, del. Cincinnati	13.82
Ala., Phila., dock del.	15.00 to 15.25
Ala., Balt., dock del.	15.00
Alabama, New York dock	15.50
Ala., Boston dock del.	15.75 to 16.75
Tenn., Bir. base, local del.	13.00
Tennessee, del. Cinn.	13.82
Montreal, delivered	23.00 to 23.50
Toronto, delivered	22.10

FOUNDRY, NO. 2X

Buffalo, fur., local del.	16.50
Buff., all-rail, Brooklyn	19.40
Buffalo, all-rail, Newark	17.78
Buff., all-rail, Boston	19.91 to 20.91
Virginia furnace	17.75
Eastern, del. Phila.	13.76 to 14.26

FOUNDRY, NO. 1X

Buffalo fur., local del.	17.50
Eastern, del. Phila.	14.26 to 14.76

MALLEABLE

Valley furnace	14.50 to 15.00
Cleveland fur., local del.	15.00
Pittsburgh dis. fur.	15.00
Pittsburgh, delivered	15.63 to 16.13
Chicago, furnace	15.50
Buffalo fur., local del.	16.50
Eastern Penna, delivered	14.63 to 18.91
Granite City, Ill., fur.	16.50 to 17.50
Montreal, delivered	24.00
Toronto, delivered	22.60

BASIC

Pittsburgh, district fur.	14.00
Pittsburgh, delivered	14.63 to 15.13
Eastern Penn., del.	13.50
Buffalo fur., local del.	15.50 to 16.00
Montreal, delivered	23.50
Valley, furnace	14.00

BESSEMER

Valley furnace	14.50 to 15.00
Pittsburgh, furnace	15.00
Pittsburgh, delivered	15.63 to 16.13

LOW PHOS.

Valley fur., standard	25.00
Philadelphia, standard	23.76 to 26.79
Copper-bear., E. Pa. fur.	21.50 to 23.00

GRAY FORGE

Valley furnace	14.00
Pittsburgh district fur.	15.00
Pittsburgh, delivered	15.63 to 16.13

CHARCOAL

Lake Superior, del. Chicago	23.04

SILVERY

Jackson County, O., fur. in per cents: 6—$18; 7—$18.50; 8—$18.75; 9—$19; 10—$19.50; 11—$20; 12—$20.50; 13—$21.50; 14—$22.50; 15—$23; 16—$24; 17—$25.50.

Pittsburgh and Buffalo furnace: 7 to 10—$19; 15—$21 to $23.

BESSEMER FERROSILICON

Jackson County, O., fur., in per cents: 10—$20.50; 11—$21; 12—$21.50; 13—$22.50; 14—$23.50; 15—$24; 16—$25; 17—$26.50.

Coke

Prices Per Net Ton

BEEHIVE OVENS

Connellsville furnace	$1.75 to 2.00
Connellsville foundry	2.50 to 4.25
New River foundry	6.00
Wise county foundry	4.25 to 5.00
Wise county furnace	3.50 to 4.25

BY-PRODUCT FOUNDRY

Newark, N. J., del.	8.21 to 8.81
Chicago, ovens, outside del.	7.00
Chicago, del.	7.75
New England, del.	10.00
St. Louis, del.	7.75
Birmingham, ovens	4.00
Indianapolis, del.	7.75
Ashland, Ky., ovens, Connell., basis	4.50
Portsmouth, O., ovens Connell., basis	4.50
Buffalo, ovens	7.50 to 8.00
Detroit, ovens	8.00
Philadelphia, del.	8.50

Iron Ore

LAKE SUPERIOR ORE

Gross ton, 51½%, Lower Lake Ports

Old range bessemer	$4.80
Mesabi bessemer	4.65
Old range nonbessemer	4.65
Mesabi nonbessemer	4.50
High phosphorus	4.40

EASTERN LOCAL ORES

Cents per unit delivered at Eastern Pennsylvania New Jersey furnaces

(Nominal)

Foundry and basic, 56-63%, contract	7.50
Copper-free low phos. 58-65%	nom.

FOREIGN ORE

Cents per units, alongside docks Atlantic ports

(Nominal)

Foreign manganiferous ore, 45-55% iron, 6-10% man.	8.50 to 9.00
North African low phos.	7.50 to 8.50
Swedish basic, 65%	7.50 to 8.00
Swedish low phos.	9.00
Spanish, North African basic, 50 to 60%	7.00 to 8.00
Newfoundland fdy., 55%	8.00
Tungsten, spot, short ton unit, duty paid	$10.00 to 10.25
Chrome ore, 48% gross ton c.i.f.	$17.00 to 18.00

Manganese Ore

(Nominal)

Prices, not including duty, are cents per unit; cargo lots.

Caucasian, 52-55%	24 cents
South African, 52%	22 to 23 cents
South African, 49-51%	21 to 22 cents
South African, 44-47%	20 to 21 cents
Indian, 48-50%	22 cents
Brazilian, 46-48%	18 cents

Refractories

FIRE CLAY BRICK

Per 1000 f.o.b. Works

First Quality

Pennsylvania, Ohio, Illinois, Kentucky, Maryland, Georgia, Alabama	$35.00
Missouri	25.00 to 35.00

Second Quality

Pennsylvania, Ohio, Illinois, Kentucky, Missouri, Maryland	25.00 to 30.00
Georgia, Alabama	30.00

SILICA BRICK

Pennsylvania	$35.00
Joliet and East Chicago	47.00
Birmingham, Ala.	50.00

MAGNESITE BRICK

Per Net Ton

Burned, 9 x 4½ x 2½	$61.50
Unburned, 9 x 4½ x 2½	52.00

CHROME BRICK

Per Net Ton

F.o.b. shipping point	$42.50

MAGNESITE

Dead burned grain, net ton, Chester, Pa., or Baltimore bases	38.00
Domes, Chewelah, Wash., base	20.90

Semifinished Steel

Prices Per Gross Ton

BILLETS AND BLOOMS

4 x 4-inch base

Pittsburgh, open-hearth	$26.00
Pittsburgh, bessemer	26.00
Youngstown	26.00
Cleveland	26.00
Philadelphia	31.75
Chicago	26.00
Forging, Chicago	31.00
Forging, Pittsburgh	31.00
Forging, Philadelphia	35.75

SHEET BARS

Pittsburgh	26.00
Youngstown	26.00
Cleveland	26.00
Chicago	28.00

SLABS

Pittsburgh	26.00
Youngstown	26.00
Cleveland	26.00

WIRE RODS

Pittsburgh, Cleveland	$37.00
Chicago	38.00

SKELP

All grades, Pittsburgh	1.50c to 1.60c

Ferroalloys

(In dollars, except Ferrochrome)

Ferromanganese, 78-82%, tidewater, duty paid	$68.00
Ferromanganese, del. Pittsburgh	73.24
Spiegeleisen, 19-20%, domestic fur. spot†	24.00
Ferrosilicon, 50 per cent, freight all., c. l.	77.50
Do, less carload	85.00
Do, 75 per cent	126.00 to 136.00
Silicomang., 2½% carb.	105.00
2% carbon	110.00
1% carbon	115.00
(The above for spot carlots. Contract price $5 a ton less).	
Ferrochrome, 60-70 chromium, 4-6 carbon, cts. lb. con. del.	10.00
Do, for spot delivery	10.50
Ferrotungsten, stand., lb. cont.	1.00 to 1.10
Ferrovanadium, 30-40 per cent, per lb. contained, on analysis	3.05 to 3.30
Ferrotitanium, c.l., prod. plant, frt. allow., net ton	137.50
Spot, 1 ton, frt., all., lb.	8.50
Do, under 1 ton	9.00
Ferrophosphorus, per ton, carload 17-19 per cent, Rockdale, Tenn., basis; 18%, $2 unitage	50.00
Ferrophosphorus, electrolytic per ton carload, 23-26% f.o.b. Anniston, Ala.; 24%, $2.75 unitage	65.00
Ferromolybdenum, stand. 50-60 per cent. per lb.	0.95
Cal. Molybdate, lb. cont.	0.80
Molybdate, lb. cont.	0.80

†Carloads. Differentials apply to quant.

Fluorspar

85 and 5 per cent grade

Washed gravel, f.o.b. Ill., Ky., net ton car loads	$12.00
Washed gravel, import duty paid tide, gross ton	18.50

Pig Iron

November Shipments Less Than In October—Sales Recede—Bank Another Southern Stack

PIG IRON PRICES, PAGE 50

Pittsburgh—Pig iron shipments recently have been as low as last summer. No open market inquiries have appeared for some time and regular contract customers are specifying only occasional truck or carloads. The price of $15, Pittsburgh district furnace, for foundry, bessemer and malleable is nominal. Railway Steel Spring Co. lighted a small open-hearth furnace at Latrobe, Pa., last week, its first activity in that department since August, 1931. The company recently bought a moderate tonnage of low phosphorus, copper-free pig iron.

Boston—Pig iron volume continues light and lack of inquiry indicates little change during the remainder of the year. Prices are unsettled with Dutch iron selling at $14 to $15, delivered. The New England furnace holds to its $16, furnace minimum; Buffalo at $14, furnace, and eastern Pennsylvania at $16.50 to $17, delivered.

The General Fire Extinguisher Co., Providence, R. I., is reported about to close on 500 tons of No. 1X and 2X for first quarter.

New York—Pig iron sellers here have passed from one of the dullest months on record into another which promises to be equally as quiet. Except the purchase of 350 tons of foundry iron for the Schenectady, N. Y., plant of the American Locomotive Co., orders are confined largely to carlots. Prices are easy, with Buffalo iron around $14, base, furnace, for delivery in this district; and eastern Pennsylvania iron at $12.75 to $13, furnace.

Philadelphia—Spot carload buying continue to dominate the market. Prices are easy, with eastern Pennsylvania foundry iron at $12.75 to $13, base, furnace, and narrow differentials for the higher silicons. Basic is nominally $13.50, delivered, eastern Pennsylvania. Of the 6382 tons of Royal Dutch iron to have arrived here recently, the bulk is for a Delaware river pipemaker. Another shipment is expected this month.

Buffalo—The November melt in this district was off about 30 per cent from the October level. The American Radiator & Standard Sanitary Corp. will resume operations at Buffalo Dec. 6, after several weeks' idleness.

Cleveland—Shipments from Cleveland blast furnaces in November were down about 25 per cent from October; other nearby lake furnaces report a drop of 10 to 15 per cent from October. Sales have struck a low level for the year, at approximately 1500 tons for the week, for furnaces with headquarters here. A general attitude of waiting has developed, with comparatively few orders in prospect this month. None of the large buyers is inquiring for first quarter; contracts placed by some of them during the October buying movement extend over that period. Prices continue nominal at $15, Cleveland furnace, for local delivery, and $14 to $14.50 for outside shipment.

Cincinnati—Pig iron shipments were well maintained in November, though new orders were smaller. Bookings totaled 500 tons during the past week. No buying for first quarter has appeared although present prices are quoted.

Chicago—Pig iron shipments are fairly steady, the decrease compared with October being slight and less than usually noted at this period. Some forward buying in rather small lots is noted. Shipments to the automotive industry have been well sustained but little additional improvement is anticipated for December. Farm equipment manufacturers have yet to enter the market for iron, but in view of the almost complete absence of buying over recent months the outlook is regarded as favorable for a slight improvement. Prices are steady at $15.50, furnace, for No. 2 foundry and malleable.

St. Louis—A further reduction in pig iron consumption is ascribed mainly to a slower rate of operations at heating equipment foundries. Jobbing foundries also have cut their operating rate. Pig iron shipments for November were slightly below those of October, which were the highest of the year.

Birmingham Ala.—Sales are not as active as a few weeks ago, and little business has been booked for delivery in December. The Woodward Iron Co. has banked one of its blast furnaces, leaving only three stacks active on foundry iron in this district.

Toronto, Ont.—The melt continues around 20 per cent, and pig iron purchases are on a hand-to-mouth basis, with weekly sales at 500 tons. Prices are firm.

Ferroalloys Are Quiet

Ferroalloy Prices, Page 50

Sellers of ferromanganese have not yet opened books for first half, although early action is expected. Meanwhile, the price is $68, duty paid. Specifications are light. Domestic spiegeleisen, 19 to 21 per cent also is moving slowly at $24, furnace, on spot carlots. Seasonal contracting has not developed.

Coke

Foundries in Middle West Contracting for Next Season—Metallurgical Grades Slower

COKE PRICES, PAGE 50

Pittsburgh—A weak price situation for metallurgical coke continues in the absence of demand. Beehive foundry coke is easy at $2.50 and $4.25, the latter for premium grades. Furnace coke ranges from $1.75 to $2.

New York—While contracting for metallurgical coke is going ahead, current shipments remain small. Prices are unchanged.

Cincinnati—Only a slight slackening in by-product foundry coke requirements was evident in the last half of November, so that shipments for the month were about equal to those in October.

Chicago—About 50 per cent of the foundry coke consumers have contracted for the first half. The market is continued at $7, ovens, for outside delivery and $7.75, delivered Chicago switching district. Spot orders are more numerous and shipments are fairly well maintained.

St. Louis—Demand for heating coke is holding up, but little interest is noted in metallurgical grades. Shipments to foundries have been reduced. By-product coke producers report practically no contracting for first quarter.

Birmingham, Ala.—Production is steady, due mainly to domestic fuel requirements. By-product foundry coke holds at $4, base, Birmingham.

Scrap

Softness Brings Lower Prices—Melters Not Buying Tonnages—Little Need in Prospect

Chicago — Activity in steel and iron scrap has declined to the point where neither consumers nor dealers are purchasing anything beyond small lots and shipments against orders are restricted sharply. Shipments to one large consumer still are suspended and dealers have little occasion to make purchases to cover what small commitments still are outstanding. Prices are weak and although transactions are lacking to develop lower figures, quotations are almost entirely nominal. Hydraulic compressed sheets are lower and cast grades also are easier.

Boston—Cast grades of scrap are weak, with dealers offering $3 to $3.50 for No. 2. Buying is light and prices in several other grades are barely steady. Worcester, Mass.,

IRON AND STEEL SCRAP PRICES

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL

Birmingham	6.50 to 7.50
Boston, dealers	3.25 to 3.75
Buffalo, No. 1	7.50 to 8.00
Buffalo, No. 2	6.25 to 6.75
Chicago	5.50 to 6.00
Cleve., No. 1	7.00 to 7.50
Cleve., No. 2	6.00 to 6.50
Det., No. 1 deal.	5.00 to 5.50
Det., No. 2 deal.	3.50 to 4.00
E. Pa. del. mill	7.00
E. Pa., No. 2 del.	5.00 to 5.50
N. Y. deal. R. R.	4.50 to 4.75
N. Y. deal. No. 2	3.00
N. Y. deal. yd.	2.50 to 3.00
Pitts. No. 1	8.75 to 9.25
St. L. No. 1 sel.	5.75 to 6.00
Federal, Ill.	5.50 to 6.00
Granite City, Ill.	5.00 to 5.50
Valleys, No. 1	8.75 to 9.25

COMPRESSED SHEETS

Buffalo, dealers	6.25 to 6.75
Chi. (Factory)	4.00 to 4.50
Cleveland	6.50 to 7.00
Detroit, dealers	4.25 to 4.75
E. Pa. new mat.	5.00 to 5.50
Pittsburgh	8.75 to 9.25
Valleys	8.25 to 8.75

BUNDLED SHEETS

Buffalo	4.25 to 4.75
Cinci., del.	4.25 to 4.75
Cleveland	4.50 to 5.00
Eastern, Pa.	5.00
Pittsburgh	7.75 to 8.25
St. Louis	1.50 to 2.00

SHEET CLIPPINGS LOOSE

Chicago	2.00 to 2.50
Cincinnati	2.00 to 2.50
Detroit, dealers	1.50 to 2.00
St. Louis	1.50 to 2.00

STEEL RAILS SHORT

Birmingham	7.50 to 8.50
Boston, dealers	2.75 to 3.00
Buffalo	9.50 to 10.00
Chicago (3 ft.)	7.50 to 8.00
Chicago (2 ft.)	8.00 to 8.50
Cinci., del.	9.00 to 9.50
Detroit, deal.	8.00 to 8.50
Pitts. (open-hearth, 3 ft. and less)	10.50 to 11.00
St. Louis	7.00 to 7.50

STOVE PLATE

Birmingham	5.75 to 6.25
Boston, dealers	2.50 to 3.00
Buffalo	7.75 to 8.00
Chicago, net	5.75 to 6.25
Cinci., deal. net	3.50 to 4.00
Det., net deal.	3.00 to 3.50
Eastern Pa.	6.00 to 6.50
N. Y., deal. mill	2.50 to 3.00
St. Louis	5.50 to 6.00

COUPLERS, SPRINGS

Buffalo	9.00 to 9.50
Chicago	6.50 to 7.00
Eastern Pa.	8.50 to 9.00
Pittsburgh	9.75 to 10.25
St. Louis	6.00 to 6.50

ANGLE BARS—STEEL

Chicago	7.00 to 7.50
St. Louis	6.00 to 6.50

LOW PHOSPHORUS

Buffalo, billets and bloom crops	9.00 to 9.50
Cleveland bil. and bloom crops	10.00 to 11.00
Eastern Pa.	8.50 to 9.00
Pittsburgh billet bloom crops	10.75 to 11.25
Pitts., sheet bar crops	10.75 to 11.25

FROGS, SWITCHES

Chicago	6.00 to 6.50
St. Louis	5.75 to 6.00

SHOVELING STEEL

Chicago	5.50 to 6.00
Cleveland	5.75 to 6.00
St. Louis	5.00 to 5.50

RAILROAD WROUGHT

Birmingham	4.50 to 5.50
Boston, dealers	1.00 to 1.50
Buffalo, No. 1	4.50 to 5.00
Buffalo, No. 2	7.00 to 7.50
Cinci., No. 2	5.50 to 6.00
Chi., No. 1, net	5.00 to 5.50
Chicago, No. 2	5.50 to 6.00
Eastern Pa.	7.00
N. Y., No. 1, deal.	2.50 to 3.00
Pitts., No. 2	8.75 to 9.25
St. Louis, No. 1	3.50 to 4.00
St. Louis, No. 2	5.00 to 5.50

SPECIFICATION PIPE

Boston	3.00 to 4.00
Eastern Pa.	7.00 to 7.50
N. Y., deal	2.00 to 2.25

BUSHELING

Buffalo, No. 1	6.25 to 6.75
Chicago, No. 1	4.00 to 4.50
Cinn., No. 1 dl.	4.00 to 4.50
Cinn., No. 2	2.50 to 3.00
Cleve., No. 2	3.00 to 3.50
Det., No. 1 new deal.	3.50 to 4.00
St. L., No. 1	3.00 to 3.50
Val. new No. 1	8.75

MACHINE TURNINGS

Birmingham	3.00 to 3.50
Boston, dealers	0.75 to 1.00
Buffalo	3.75 to 4.25
Chicago	3.00 to 3.50
Cin., deal.	3.00 to 3.50
Cleveland	4.50 to 5.00
Detroit	1.75 to 2.25
Eastern Pa.	3.00 to 3.50
N. Y., deal	1.35 to 1.50
Pittsburgh	6.25 to 6.75
St. Louis	1.50 to 2.00
Valleys	6.50 to 7.00

BORINGS AND TURNINGS

For Blast Furnace Use

Boston, dealers	.75 to .90
Buffalo	3.75 to 4.25
Cinn., deal.	3.00 to 3.50
Cleveland	4.50 to 5.00
Detroit, deal	2.25 to 2.75
Eastern Pa.	3.50 to 3.75
N. Y., deal	1.35 to 1.50
Pittsburgh	6.50 to 7.00

CAST IRON BORINGS

Birming., chem.	12.00 to 13.00
Birming., plain	3.00 to 3.50
Boston, chem.	5.50 to 6.00
Boston, dealers	1.00 to 1.25
Buffalo	4.25 to 4.50
Chicago	4.00 to 4.50
Cinn., deal.	3.00 to 3.50
Cleveland	4.50 to 5.00
Detroit, deal.	2.25 to 2.75
Eastern Pa.	3.50 to 3.75
E. Pa., chem.	8.00 to 10.50
N. Y., deal	1.00 to 1.50
Pittsburgh	6.50 to 7.00
St. Louis	2.75 to 3.25

PIPE AND FLUES

Cinn., deal.	3.25 to 3.50

RAILROAD GRATE BARS

Buffalo	4.00 to 4.50
Chicago, net	5.00 to 5.50
Cincinnati	4.00 to 4.50
Eastern Pa.	5.50 to 6.00
N. Y., deal.	3.50 to 4.00
St. Louis	4.50 to 5.00

FORGE FLASHINGS

Boston, dealers	2.00 to 2.50
Buffalo	5.50 to 6.00
Cleve. ov. 10 in.	6.00 to 6.50
Detroit	3.00 to 3.50

FORGE SCRAP

Boston, dealers	1.75 to 2.00
Chicago	6.50 to 7.00
Eastern Pa., del.	5.00 to 5.50

ARCH BARS, TRANSOMS

Chicago, net	5.00 to 5.50
St. Louis	4.00 to 4.50

AXLE TURNINGS

Boston, deal.	2.50 to 3.00
Buffalo	6.50 to 7.00
Chi., elec. fce.	4.50 to 5.00
Cleveland	5.50 to 6.00
Eastern Pa., del.	7.00
Pittsburgh, O. H.	7.50 to 8.00
St. Louis	3.50 to 4.00

STEEL CAR AXLES

Birmingham	9.00 to 9.50
Boston, ship. pt.	6.00 to 6.50
Buffalo	10.00 to 10.50
Chicago, net	8.50 to 9.00
Eastern Pa.	14.50
St. Louis	9.00 to 9.50

SHAFTING

Boston, ship. pt.	7.00 to 7.50
N. Y., deal.	6.50 to 7.00
St. Louis	7.50 to 8.00
E. Penna.	11.00 to 12.00

CAR WHEELS

Birming., iron	7.00 to 7.50
Boston, iron deal.	3.50 to 4.00
Buffalo, iron	7.00 to 8.00
Buffalo, steel	8.50 to 9.00
Chicago, iron	7.00 to 7.50
Chi., rolled steel	7.00 to 7.50
Cincinnati iron	6.25 to 6.75
E. Pa. steel	8.50 to 9.00
E. Pa. iron	9.00 to 9.50
Pitts., iron	9.00 to 9.50
Pitts., steel	9.50 to 10.00
St. Louis, iron	5.00 to 5.50
St. Louis, steel	7.00 to 7.50

NO. 1 CAST SCRAP

Birmingham	6.50 to 7.00
Buffalo (Mach.)	10.00 to 10.25
Buffalo, cupola	9.00 to 9.50
Boston, textile	6.75 to 7.00
Boston No. 2	3.00 to 3.25
Chi., mach. net	6.00 to 6.50
Chi., railroad, net	5.25 to 5.75
Chicago, agri., net	5.25 to 5.75
Cinn., mach. cup.	7.00 to 7.50
Cleve. cupola	7.00 to 8.00
Det., net deal.	6.50 to 7.00
E. Pa. cupola	9.00 to 9.50
N. Y., cup. deal.	5.50 to 6.50
N. Y., del. local foundries	8.00 to 8.50
Pitts., cupola	9.00 to 9.50
San Fran., del.	13.50 to 14.00
Seattle	4.50 to 6.50
St. L. No. 1 ma.	6.50 to 7.00
St. L., No. 1	6.00 to 6.50

HEAVY CAST

Boston, del.	3.50 to 4.50
Bost., mach. cast	7.00 to 7.50
Buffalo, break	6.50 to 7.00
Cleve., break	5.50 to 6.00
Detroit, auto. net deal.	7.00 to 7.50
Det., break., dl.	4.00 to 4.50
Eastern Pa.	8.50
N. Y. No. 1, dl.	5.00 to 5.50
N. Y. break, dl.	4.75 to 5.25
Pittsburgh	8.00 to 8.50

MALLEABLE

Boston, consum.	8.00 to 8.50
Buffalo	8.00 to 8.50
Chicago, agri.	5.00 to 5.50
Chicago, R. R.	6.00 to 6.50
Cinci., R. R., del.	7.00 to 7.50
Cinci., agri. del.	6.50 to 7.00
Cleveland, rail	7.50 to 8.00
Det. auto deal.	5.00 to 5.50
St. Louis, rail	4.50 to 5.00

RAILS FOR ROLLING

5 feet and over

Birmingham	7.50 to 7.75
Boston, deal.	5.00 to 5.50
Buffalo	7.00 to 7.50
Chicago	8.25 to 8.75
Eastern Pa.	9.50
New York dealer	4.25 to 4.75
St. Louis	7.00 to 7.50

LOCOMOTIVE TIRES

Chicago, cut	7.00 to 7.50
St. L., No. 1	5.00 to 5.50

LOW PHOS. PUNCHINGS

Chicago	7.50 to 8.00
Buffalo	9.00 to 9.50
Eastern Pa.	8.50 to 9.00
Pittsburgh	10.75 to 11.25

melters still pay $5 to $5.25, delivered, for No. 1 steel. Outside shipments by rail are at a standstill, but an occasional barge load is sold.

New York—Scrap buying is dull, with several grades easier. One eastern pipe foundry has reduced its price on cupola cast 25 cents. Skeleton steel also is lower. Several of the steadiest consumers have held up shipments and are not buying. Coatesville is paying $7, delivered for No. 1 steel, but shipments are not heavy. For No. 2 steel for barge loading $3 continues to be paid.

Philadelphia — Eastern Pennsylvania scrap prices have been reduced on several grades, including notably heavy melting steel, wrought, machine shop turnings and rolled steel wheels. The revision in No. 1 heavy melting steel to a flat price of $7, delivered, follows the fulfillment of a $7.50 a ton order placed some time ago by a Coatesville, Pa., consumer. No. 2 heavy melting steel is off 50 cents to $5 to $5.50, and heavy breakable cast is now holding at a flat price of $8.50, delivered. As noted recently, approximately 800 tons of this material was booked for shipment to Coatesville, Pa., at this price. General buying continues negligible, with most of the recent reductions nominal.

Buffalo—Predictions that at least two large melters of steel will make purchases here within the next five weeks are heard with renewed emphasis this week. It is probable that regardless of when the purchases are made deliveries will not begin until after Jan. 1. Consumers' stocks are known to be the lowest for many months, and in addition it is admitted that steelworks have practically nothing under contract for future delivery.

Pittsburgh — Next week bids on two important railroad scrap lists will be closed. The Pennsylvania list of 30,800 tons goes in Dec. 7 and the Baltimore & Ohio's offering of 5100 tons, Dec. 5. Ten thousand tons of heavy melting are included in the former and 1200 tons of the same in the latter. The Pennsylvania railroad is also offering 10,500 tons of scrap rails. The iron and steel scrap market here is weak, but prices on leading grades have not been changed in view of the utter absence of sales for consumption. No. 1 heavy melting steel continues to be quoted at $8.75 to $9.25.

Cincinnati — Prices of iron and steel scrap are easier, so that dealer purchases to cover on contracts are lending some support to an otherwise dull market, conditions resembling those of last summer.

Cleveland—Trading in steel and iron scrap is less active, if possible, than in recent weeks. Sales are occasional small lots and shipments are restricted. Prices are nominal and show no change. Conditions in scrap in the Valley are dull and prices have been marked down 25 cents.

Detroit—A progressively weaker situation in iron and steel scrap has lowered half the classifications here 25 to 50 cents. This is due to the combination of a slight improvement in offerings by automobile manufacturers and the abstinence of practically all consumers from the market. Heavy melting steel has remained unchanged at $5 to $5.50, but compressed sheets are off 50 cents to $4.25 to $4.75.

St. Louis—Activity in iron and steel scrap has receded to the lowest point of the year and for the present depression. The undertone is easier, but absence of new purchasing leaves the market untested on most grades, and dealers' quotations are largely nominal.

Birmingham, Ala. — Movement of steel and iron scrap is slow and prices are weak. Sales are in small lots and for immediate needs only.

Toronto, Ont.—Demand for iron and steel scrap is of a specialized nature. Mills are out of the market and only small movement is reported in steel grades. Montreal dealers are shipping some heavy melting steel against spot orders.

Wire Rods Reaffirmed

Semifinished Prices, Page 50

Within a few days, reaffirmation of $26 base, Pittsburgh, Youngstown O., and Cleveland, is likely for billets, sheet bars and slabs. Wire rods have been reaffirmed at $37 base, Pittsburgh, for first quarter. A mill in the Pittsburgh district is reclassifying the analyses of a large stock of semifinished steels, mainly blooms, with the intention of disposing of the stock to customers who can use the desired analysis.

Equipment

Year-End Dullness Holds as Purchases Are Delayed

New York—A small list, about eight tools for a technical school at New Rochelle, N. Y., including a lathe, drill and grinder, has been placed with a New York dealer, but buying and inquiry for equipment shows practically no improvement. Inquiry especially is light. Most activity is on government requirements.

Worcester, Mass.—Dullness which has prevailed in the demand for machine tools shows slight change while little new equipment is being figured for possible next year's needs. A few shops, notably one grinding tool builder, are operating on fairly full schedules, but part-time rules generally. The Russian government purchasing agency may be in the market for some equipment early in the year, but this is not definite. Jones & Lamson Machine Co., Springfield, Vt., is low on a turret lathe with spares for delivery to the navy, San Pedro, Calif. Textile machinery builders are less active.

Pittsburgh—Continued lack of orders for mill equipment from steel mills in this district is noted. The pending list of work looms just as formidable but obtaining releases on this work is as difficult as in weeks past. Last week several orders for machinery to interests in this district were reported and at the same time a few active inquiries were issued. This latter activity in the machine tool business in this district is the first in many months.

Cleveland—December business in machinery and equipment is tapering off somewhat from previous months, as is usual at the end of the year. However, a fair amount of inquiry holds up and dealers do not regard the outlook as hopeless. List prices on equipment generally have not been reduced, although, as one sales manager expressed it, "there is more than one way to kill a cat," implying that quoted prices in some cases are being "adjusted."

Chicago—Despite the small volume of business in machine tools and plant equipment, the market retains a fair degree of activity. Users show interest in the purchase of new equipment although there is a tendency to defer the placing of orders at this time. Machine tool sellers believe the amount of inquiry pending indicates possibilities of some betterment in sales after the first of the year. Demand for repair parts is improved over activity of several months ago. Railroads continue out of the market and show little interest in new purchases. Little additional business is looked for from manufacturers of farm equipment despite a small gain in activity at some plants.

Nonferrous Mill Products

Base price cents per pound f.o.b. mill except otherwise specified. Copper and brass product prices based on 6.25c, Conn., for copper

SHEETS	
Yellow brass (high)	12.50
Copper, hot rolled	15.37½
Lead sheets, cut, to jobbers	7.00
Zinc sheets (100-lb. base)	9.00
TUBES AND PIPES	
Seamless yellow brass (high)	15.25
Seamless copper	14.37½
RODS	
Yellow brass (high, full turning)	10.25
Naval brass	11.37½
ANODES	
Copper, untrimmed	12.25
WIRE	
Yellow brass (high)	12.50

Old Metals

Dealers' buying prices, cents lb. No. 1 Composition Red Brass

New York	2.87½ to 3.00
Chicago	2.25 to 2.50
Cleveland	2.50 to 2.75
St. Louis	2.50
HEAVY YELLOW BRASS	
New York	1.87½ to 2.00
HEAVY COPPER AND WIRE	
New York	3.62½ to 3.87½
Chicago, No. 1	3.25 to 3.50
Cleveland	2.75 to 3.00
St. Louis	2.75
COMPOSITION BRASS BORINGS	
New York	2.50 to 2.75
YELLOW BRASS TUBING	
Cleveland	1.50 to 2.00
LIGHT COPPER	
New York	2.87½ to 3.00
Chicago	2.25 to 2.50
Cleveland	2.25 to 2.50
St. Louis	2.50
LIGHT BRASS	
Chicago	1.25 to 1.50
Cleveland	1.00 to 1.25
St. Louis	1.50
LEAD	
New York	2.00 to 2.25
St. Louis	2.00
ZINC	
New York	1.12½ to 1.25
Cleveland	1.00 to 1.12½
St. Louis	1.25
ALUMINUM	
Clippings, new, soft, Cleve.	9.50 to 10.00
Clippings, hard, Cleveland	6.50 to 7.00
Borings, Cleveland	3.00 to 3.50
Mixed cast, Cleveland	4.00 to 5.00
Mixed cast, St. Louis	3.75 to 4.00

Secondary Metals

Remelt aluminum No. 12	8.00 to 9.00
Brass ingot, 85-5-5-5	5.75

Metals

Slack Demand and Depressing Developments Bring Declines in Leading Classifications

New York—Easiness developed in metal prices last week in view of extreme dullness of demand coupled with such important influencing factors as uncertainty over the world conference on copper curtailment, easiness in Wall street, record lows on sterling exchange due to doubt over the war debts and declines in leading commodity prices.

Copper—Attention of the copper trade last week was principally centered on the world conference of producers here with regard to curtailment of production and allocation of remaining open world markets. The demand of the low-cost African producer, Roan Antelope Copper Mines Ltd., for an increased production quota proved an obstacle to the procedings and the conference adjourned Thursday until tomorrow when the company's managing director is scheduled to arrive from England. The meetings have been entirely secret and probably little officially will be learned until their conclusion. One custom smelter offered electrolytic metal on one day last week at the record low price of 5.12½c, Connecticut, for prompt delivery. Generally 5.25c was asked for shipment through first quarter and 5.37½c for second. Mine producers remained out of the market at the asking price of 6.25c. No change was reported in products or secondary ingot.

Zinc—Demand was extremely dull and some sellers offered prime western metal at 3.12½c, East St. Louis, in an effort to stimulate buying. Only occasional inquiries were reported.

Lead—Most sellers asked 2.90c, East St. Louis, and 3.00c, New York, through the week but some metal changed hands at the shaded price of 2.87½c, East St. Louis. Demand was very quiet. Sellers now are taking business for delivery in January at current prices.

Tin—Sales were extremely restricted with quotations generally nominal. Prices were depressed under the influence of a slump in sterling exchange. Domestic deliveries in November were the heaviest since June.

Antimony—Quotations held unchanged through the week but demand was unimproved.

Silver—Commercial bars fell to a new record low of 25.00c, an ounce New York, Friday.

Renew Distillate Prices

New York—Consumers of naphthalene are slow to cover for next season's supply. Spot business is light. Car lots of flakes and balls are being quoted 4.75c a pound, the spread of 1 cent a pound between the two being eliminated. Prices on distillates are being extended to next year. Consumers generally are keeping down purchases.

Coke By-Products

Per Gallon, Producers' Plants, Tank Lots

	Spot
Pure benzol	$0.20
90 per cent benzol	0.20
Toluol	0.30
Solvent naphtha	0.26
Commercial xylol	0.26

Per Pound at Producers' Plants in 250-Pound Drums

Phenol	0.153 to 0.173

Per Pound at Producers' Plants

Naphthalene flakes	4.75 to 5.75
Naphthalene balls	4.75 to 5.75

Per 100 Pounds Atlantic Seaboard

Sulphate of ammonia	$1.0525

Quicksilver Steady

New York — Quicksilver is little changed from prices quoted a week ago, small lots being available at $49 to $50, a virgin flask of 76 pounds. Round lots are reported offered as low as $48. The market is quiet.

Nonferrous Metal Prices of the Week, Cents a Pound

Spot unless otherwise specified

	Copper—Electro., del. Conn.	Copper—Lake, del. Midwest	Copper—Casting refinery	Straits Tin New York Spot	Straits Tin New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 98-99%	Antimony Spot, N. Y.	Ingot Nickel
Nov. 26	5.37½	5.62½	5.12½	22.75	22.87½	3.00	2.90	3.15	22.90	5.75	35.00
Nov. 28	5.25	5.50	5.00	22.37½	22.50	3.00	2.90	3.15	22.90	5.75	35.00
Nov. 29	5.25	5.50	5.00	22.00	22.15	3.00	2.90	3.12½	22.90	5.75	35.00
Nov. 30	5.25	5.37½	5.00	22.50	22.65	3.00	2.90	3.12½	22.90	5.75	35.00
Dec. 1	5.25	5.37½	5.00	22.70	22.92½	3.00	2.87½	3.12½	22.90	5.75	35.00
Dec. 2	5.12½	5.37½	4.87½	22.45	22.67½	3.00	2.87½	3.12½	22.90	5.75	35.00

Pacific Coast

Aqueduct and Bridge Tonnages About to Be Bid Involve Much Steel—Foreign Steel in Small Lots Invades Western Coast Without Severe Effect — Most Selling Now Is Limited

San Francisco (*By Air Mail*)—Interest this week is centered around the opening of bids Nov. 29 for the Colorado aqueduct project, involving close to 240,000 tons of steel. It is expected the call for bids for the San Francisco-Oakland bridge, involving 170,000 tons of structural steel, 20,000 tons of reinforcing steel and 17,000 tons of steel cable, will be issued within the next few days.

The only reinforcing bar award of size, reported this week, went to the Concrete Engineering Co. and involved 115 tons for the completion of the Sunnyvale, Calif., dirigible base hangar. Truscon Steel Co. took 325 tons for the Tuolumne river bridge near Modesto, Calif., reported as having gone to unnamed interests several weeks ago. Bids will be opened Dec. 19 and Dec. 30, respectively, for 120 tons and 110 tons for highway work in San Joaquin county, Calif., and for a postoffice at Redlands, Calif. Out-of-stock quotations remain unchanged in both the Los Angeles and San Francisco districts at 2.40c, base, on carload lots.

Bids will be opened Dec. 16 for a standpipe for Hamilton Field, Calif., involving 125 tons. Prices remain unchanged at 2.00c, c.i.f.

Bethlehem Fabricators Inc. booked 120 tons and 80 tons of shapes, respectively, for postoffices at Vallejo and Napa, Calif. J. L. Young Engineering Co. took 300 tons for an immigration station in Honolulu. Bids are being taken on 900 tons for the Knights Landing bridge, Sacramento, Calif. Bids open Dec. 30 on 100 tons for a postoffice at Redlands, Calif. Wide flange material holds at 2.20c, c.i.f., while standard shapes are quoted at 2.10c.

Unnamed interests took 100 tons of cast iron pipe for Albuquerque, N. Mex. San Bruno, Calif., will open bids Dec. 7 for 482 tons. Bids on 217 tons for Huntington Park, Calif., were rejected. National Cast Iron Pipe Co. was low on 284 tons for Vernon, Calif.

Foreign Steel Competes

Seattle—European materials are being offered in markets of the Pacific Northwest well below prices of American manufacturers. Some German plates for tank work were recently landed and are selling at around 1.50c, it is reported, against 2.00c for domestic products. Imported bars and shapes are also reported available at 1.40c to 1.50c. While this competition is disconcerting it is not having much effect in view of the small tonnages being placed and the disposition of public officials to favor American manufacturers when possible. Imports are in larger volume and are influencing the Portland market more than in Seattle territory.

Unstated tonnages for the St. Johns, Oreg., postoffice have been awarded by Anderson Construction Co., Portland, Oreg., reinforcing steel to Mercer Steel Co., and shapes to Pacific Iron Works, Portland. The Alaska railroad has awarded to Bethlehem Steel Corp. 143 tons of sheet piling to be shipped in December from the Bethlehem plant. Puget Sound navy yard is in the market for a small tonnage of small diameter pipe and tubing. McNeil Island prison opened bids this week for miscellaneous iron and grill work.

Steel in Europe

British Iron and Steel Trade Improving Steadily

London — (*By Cable*) — Sales of pig iron for foreign shipment are expanding, Italy having bought some tonnages of hematite. Domestic steel demand is increasing in the Middlesbrough area, especially for semifinished and for bridgebuilding shapes. Trade is dull in the Midlands as a result of large stocks of Continental steel still unsold. Increasing orders for export have been coming to Scottish makers. Galvanized sheets are dull and tin plate quiet.

The Continent reports export trade is quieter, with some semifinished steel sold to England. Prices have declined slightly in the past few days. A German steelmaker has booked 3000 tons of steel angles at £3 1s ($13.82).

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Dec. 1

Export Prices f.o.b. Ship at Port of Dispatch—By Cable (or Radio)

	British gross tons U. K. ports		Continental Channel or North Sea ports, metric tons Gold parity, $4.8665	
	£ s d		£ s d	£ s d
PIG IRON				
Foundry, 2.50-3.00 Silicon	$ 9.45	2 18 6	$8.27	1 14 0
Basic bessemer	8.72	2 14 0*	6.81	1 8 0
Hematite, Phos. .03-.05	9.53	2 19 0	.....	.....
SEMIFINISHED STEEL				
Billets	$15.75	4 17 6	$10.46	2 3 0
Wire rods, No. 5 gage	24.25	7 10 0	21.90	4 10 0
FINISHED STEEL				
Standard rails	$25.03	7 15 0	$26.77	5 10 0
Merchant bars	.90c	6 5 0	.64c	2 18 0
Structural shapes	1.06c	7 7 6	.50c to .51c	2 5 0 to 2 6 0
Plates, †¼ in. or 5 mm.	1.26c	8 15 0	.72c to .73c	3 5 0 to 3 6 0
Sheets, black, 24 gage or 0.5 mm.	1.19c	8 5 0	1.29c	5 17 6
Sheets, gal., 24 gage, corr.	1.44c	10 0 0	1.43c	6 10 0
Bands and strips	1.12c	7 15 0	.77c to .80c	3 10 0 to 3 12 6
Plain wire, base	1.37c	9 10 0	1.18c	5 7 6
Galvanized wire, base	1.66c	11 10 0	1.38c to 1.40c	6 5 6 to 6 7 6
Wire nails, base	1.58c	11 0 0	1.21c	5 10 0
Tin plate, box 108 lbs.	$ 2.58	0 16 0	$3.20	0 13 2

British ferromanganese $68 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d ($43.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

		£ s d		French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5	$ 9.45	2 18 6	$ 8.02	205(2)	$ 8.31	300	$16.42	69
Basic bessemer pig iron	8.72	2 14 0*	6.65	170(1)	7.48	270	17.96	75.50
Furnace coke	1.94	0 12 0	4.85	124	3.05	110	4.57	19.20
Billets	16.15	5 0 0	14.47	370	10.94	395	22.96	96.50
Standard rails	1.19c	8 5 0	1.25c	697	1.50c	1,150	1.37c	127
Merchant bars	.97c	6 15 0	.95c	530	.71c	545	1.19c	110
Structural shapes	1.26c	8 15 0	.99c	550	.66c	505	1.16c	107.50
Plates, †¼-in. or 5 mm.	1.30c	9 0 0	1.17c	650	.81c	625	1.37c	127
Sheets, black	1.33c	9 5 0§	1.44c	800‡	.91c	700‡	1.56c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	1.62c	11 5 0	2.83c	1,570	1.87c	1,440	4.00c	370
Plain wire	1.37c	9 10 0	2.03c	1,130	1.69c	1,300	1.92c	178
Bands and strips	1.37c	9 10 0	1.02c	565	.88c	675	1.37c	127

*Basic. †British ship-plates, Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price.
British quotations are for basic open-hearth steel. Continental usually for basic-bessemer steel.

STEEL, WROUGHT AND CAST IRON PIPE, AND TUBING

Welded Iron, Steel Pipe □

Base Discounts on steel pipe, Pittsburgh and Lorain, O., to consumers in carloads. Indiana Harbor, Ind., and Evanston, Ill., 2 points less. Chicago del., 2½ points less. Wrought pipe, Pittsburgh base.

BUTT WELD

	Steel			Iron	
In.	Blk.	Gal.	In.	Blk.	Gal.
¼ & ⅜	57	34	½	28	10½
½	62	49½	¾	33	16½
¾	65½	55	1—1¼	36	20½
1—3	67½	57	2	38	21

LAP WELD

2	61	50½	2	26	12½
2½ to 6	64½	54	2½—3½	33	18½
8	62	51	4—6	35	22
10	60	49	7—8	34	21½
12	59	48	9—12	31	16½

BUTT WELD

Extra strong, plain ends

⅛	48	33	¼ & ⅜	+7	+41
¼ & ⅜	53½	38½	½	28	12½
½	59	49½	¾	33	17½
¾	63½	54	1—2	39	23

LAP WELD

Extra strong, plain ends

2	59	49½	2	34	18½
2½ to 4	62½	53	2½—4	39	25
5 & 6	62	52½	4½—6	38	24
8	58	47	7 & 8	36	22
10	51½	40½	9—12	26	13½
12	50½	39½			

STEEL LINE PIPE

2 to 3 butt	66½	2½ to 6 lap	63½
2 lap	60	8 lap	61
10 lap	59	12 lap	58

Discounts on steel pipe are net and not subject to any point or preferential. On iron pipe, the discounts shown on the cards are net, and are not subject to any further discounts or preferentials.

BOILER TUBES

Carload discounts, f.o.b. Pittsburgh

Lap Welded Steel		*Charcoal Iron*	
¿—2¼	38	1¾	8
2½—2¾	46	2—2¼	13
3	52	2½—2¾	16
3¼—3¾	54	3	17
4	57	3¾—3½	18
4½—6	46	4	20
1½	1	4½	21

On lots of a carload or more, above base discounts subject to preferential of two 5 per cent discounts on steel and 10 per cent on charcoal iron. Smaller quantities subject to following modifications from base discounts.

Lap Welded Steel—Under 10,000 pounds, 6 points under base and one 5 per cent; on 10,000 pounds to carload, 4 points under base and two 5 per cents. Charcoal Iron—under 10,000 pounds, 2 points under base; on 10,000 pounds to carload, base and one 5 per cent.

STANDARD COMMERCIAL SEAMLESS BOILER TUBES COLD DRAWN

1 inch	61	3	46
1¼—1½	55	3¼—3½	48
1¾	37	4	51
2—2¼	32	4½, 5, 6	40
2½—2¾	40		

HOT ROLLED

2—2¼	38	3¼—3½	54
2½—2¾	46	4	57
3	52	4½ 5, 6	46

Quantity discounts are: Under 10,000 pounds, 10 points and 5 per cent; 10,000 to 24,999 pounds, 6 points and 5 per cent; 25,000 pounds to carload, 2 points and 5 and 5 per cent; carload and over, base discount and 5 and 5 per cent. No extra for lengths up to and including 24 feet. Sizes smaller than 1 inch and lighter than standard gage to be held at mechanical tubes list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Tubing □ □

Cold drawn; f.o.b. mill discounts

Random lengths over 5 ft. 55%
Selected lengths, 1—18 ft. 53%

Cast Iron Water Pipe □ □

Class B Pipe—Per Net Ton

Six-inch and over, Bir. ...$32.00 to 33.00
Four-inch, Birmingham .. 36.00 to 37.00
Four-inch, Chicago ..... 43.40 to 44.40
Six to 24-inch, Chicago..... 40.40 to 41.40
Six-inch and over, N. Y... 32.00 to 34.50
Four-inch, New York ..... 34.50 to 36.50
Stand. fittings, Bir. base.... $100.00

Six to 24-inch, base; over 24-inch plus $20; 4-inch, plus $10; 3-inch plus $20; gas pipe fittings, $5 higher. Class A pipe $4 higher than Class B.

Warehouse Quotations at Leading Centers, in Cents Per Pound

(All Philadelphia prices subject to quantity differentials except reinforcing and Swedish bars)

STEEL BARS

Baltimore*	2.35c
Boston	3.25c
Buffalo	2.95c
Chattanooga	3.00c
Chicago	2.75c
Cincinnati	3.00c
Cleveland	2.75c
Detroit	2.85c
Houston	2.65c
Los. Ang.	3.30c
New York‡(d)	3.10c
Philadelphia	2.45c
Pittsburgh	2.60c
Portland	3.35c
San Fran.	3.15c
Seattle	3.00c
St. Louis	3.00c
St. Paul	3.00c
Tulsa	3.25c

IRON BARS

Baltimore	2.35c
Boston	3.25c
Buffalo	3.15c
Chattanooga	3.00c
Chicago	2.75c
Cincinnati	3.00c
Detroit	2.85c
New York‡(d)	3.10c
Philadelphia	2.45c
St. Louis	3.00c
Tulsa	3.25c

REINFORC. BARS

Baltimore	2.35c-3.00c
Boston	3.10c-3.25c
Buffalo	2.95c
Chattanooga	3.00c
Cincinnati	3.00c
Cleveland	2.10-2.25c
Detroit	2.85c
Houston	3.00c
Los. Ang. cl.	2.10c
Los Ang., lcl	2.40c
New York	2.65c-3.10c
Phila.	2.26½c
Pittsburgh	2.60c
San Fran. cl.	2.40c
San Fran. lcl	2.80c
Seattle	3.00c
St Louis	3.15c
Tulsa	3.25c
Young.	2.30c-2.60c

SHAPES

Baltimore*	2.35c
Boston	3.35c
Buffalo	3.20c
Chattanooga	3.20c
Chicago	3.00c
Cincinnati	3.25c
Cleveland	2.95c
Detroit	3.10c
Houston	3.25c
Los. Ang.	3.30c
New York(d)	3.10c
Philadelphia	2.45c
Pittsburgh	2.85c
Portland	3.35c
San Fran.	3.15c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3.25c
Tulsa	3.50c

PLATES

Baltimore*	2.35c
Boston	3.35c
Buffalo	3.20c
Chattanooga	3.20c
Chicago	3.00c
Cincinnati	3.25c
Cleveland, ¼-in. and thicker	2.95c
Clev., 3/16-in.	3.20c
Detroit	3.10c
Det., 3/16-in.	3.10c
Houston	3.00c
Los Angeles	3.30c
New York(d)	3.30c
Philadelphia	2.45c
Phila. floor	5.10c
Pittsburgh	2.85c
Portland	3.35c
San Fran.	3.15c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3.25c
Tulsa	3.50c

NO. 10 BLUE

Baltimore*	2.80c
Boston	3.50c
Buffalo	3.45c
Chattanooga	3.50c
Chicago	3.20c
Cincinnati	3.30c
Cleveland	3.00c
Detroit	3.35c
Houston	3.35c
Los Ang.	3.60c
N. Y.	3.00c
Portland	4.00c
Phila.*† (e)	2.90c
Pitts.**	3.00c
San Fran.	3.50c
Seattle	4.00c
St. Louis	3.45c
St. Paul	3.45c
Tulsa	3.70c

NO. 24 BLACK

Balt.*†	3.50c
Boston	4.20c
Buffalo	3.70c
Chattanooga	3.65c
Chicago	3.55c
Cincinnati	3.75c
Cleveland	3.25c
Detroit	3.50c
Los Ang.	4.20c
New York	3.75c-4.00c
Phila.*†(e)	3.40c
Pitts.**	3.40c
Portland	4.50c
San Fran.	3.90c
Seattle	4.50c
St. Louis	3.80c
St. Paul	3.695c
Tulsa	4.75c

NO. 24 GAL. SHEETS

Balt.*†	4.00c
Boston	4.75c
Buffalo	4.05c
Chattanooga	3.95c
Chicago	4.10c
Cincinnati	4.25c
Cleveland	3.75c
Detroit	3.75c
Houston	4.25c
Los. Ang.	4.50c
New York	4.00c-4.10c
Phila.*†(e)	3.75c
Pitts.**	3.90c
Portland	5.00c
San. Fran.	4.55c
Seattle	5.00c
St. Louis	4.35c
St. Paul	4.19c
Tulsa	5.10c

†BANDS

Baltimore	2.65c
Boston	3.75c
Buffalo	3.30c
Chattanooga	3.20c
Chicago	2.95c
Cincinnati	3.20c
Cleveland	3.00c
Det. 3/16-in. & lighter	3.15c
Houston	3.65c
Los Ang.	3.80c
New York(d)	3.30c
Philadelphia	2.75c
Pittsburgh	2.95c
Portland	3.85c
San Fran.	3.15c
Seattle	3.50c
St. Paul	3.20c
Tulsa	3.45c

†HOOPS

Baltimore	2.65c
Boston	4.90c
Buffalo	3.95c
Chicago	3.50c
Cincinnati	3.75c
Det. No. 14 & lighter	3.30c
New York	3.30c
Philadelphia	3.00c
Pittsburgh	3.60c
Seattle	5.00c
St. Paul	3.75c

†New extras apply.

COLD FIN. STEEL

Rounds & Hexagons

Baltimore (c)*	3.48c
Boston	3.60c
Buffalo	3.00c
Chattanooga*	3.65c
Chicago	3.00c
Cincinnati	3.32c
Cleveland	2.95c
Detroit	3.15c
Los Ang. (a)	4.25c
New York	3.39c
Philadelphia*	3.35c
Pittsburgh	2.95c
Portland (a)	4.50c
San Fran. (d)(f)	5.55c
Seattle (a)	4.50c
St. Paul (a)	3.20c
St. Louis	3.36c
Tulsa	4.65c

Flats and squares 50c extra, except Tulsa, where 5.14c is quoted.

COLD ROLL. STRIP

Boston 0.100 in., 500 lb. lots	5.30c
Buffalo	5.25c
Chicago (b)	5.65c
Cincinnati	5.80c
Cleve. (b)	5.55c
Detroit	5.40c
Phila. (c)	4.55c
New York	4.55c

(a) Rounds, hex, only.
(b) Net base straightening, cutting, boxing 1 ton or more.
(c) Plus mill, size and quantity extras.
(d) Minus quant. diff.
(e) New mill classif.
(f) Rounds only.
‡Domestic bars.
*Plus quan. extras.
**Less than 25 sheets.
*†50 or more bundles.

Here and There in Industry

AMERICAN ROLLING MILL CO., Middletown, O., acquired properties of Lake Erie Steel & Blanking Co., Cleveland, jobber of sheets, specializing in sheared blanks for press shop requirements. M. S. Phillips has been made president and general manager of the company. He has been assistant to the manager of sales for the American Rolling Mill Co.

□ □ □

Inland Steel Co., Indiana Harbor, Ind., has placed an order with Surface Combustion Corp., Toledo, O., for an oil-fired sheet normalizing furnace, approximately 120 feet long, with capacity of about 140 tons per 24 hours.

□ □ □

Mills Co., Cleveland, manufacturer of metal partitions, has appointed H. G. Balthasar, 626 Broadway, Cincinnati, its sales representative in that district, to handle all lines of its manufacture.

□ □ □

Fairbanks, Morse & Co., Chicago, have established southeastern headquarters at 515 Whitehall street, Atlanta, Ga., in charge of O. O. Lewis, who has been transferred from Chicago. The Atlanta office supersedes that formerly maintained at Jacksonville, Fla.

□ □ □

Morse Twist Drill & Machine Co., New Bedford, Mass., has established a complete stock of high speed and carbon drills, reamers, taps, dies and milling cutters at 570 West Randolph street, Chicago, to supplement distributors' stocks in Chicago and the Middle West and give prompt deliveries.

□ □ □

Stedman's Foundry & Machine Works, Aurora, Ind., has made an arrangement with John T. Hepburn Ltd., 18 Van Horne street, Toronto, Ont., under which the latter will produce the principal Stedman line of machinery for the Canadian and British markets, including crushing, grinding, pulverizing, mixing and screening equipment.

□ □ □

Link-Belt Co., Chicago, has appointed Moore-Handley Hardware Co., 25 South Twentieth street, Birmingham, Ala., distributor and direct representative for its entire line of elevating, conveying and power transmission machinery in Birmingham territory. Stock of Link-Belt chains, gears, sprockets, transmission machinery and screw conveyors will be carried to make possible prompt deliveries.

□ □ □

Falk Corp., Milwaukee, has appointed G. J. Sturmfelsz, 1620 East Thirty-second street, Baltimore, its representative in the Baltimore district, and H. Douglas Stier in Atlanta, Ga., district, with offices at 101 Marietta street. Products of the Falk Corp. include speed reducers, flexible couplings and other power transmission equipment. A new line is its motoreducer, providing a straight line drive by compact combination of motor and speed reducer in a single mounting.

Profits in Steel Industry; A Sound Prescription

(*Concluded from Page* 13)

$55.70 per ton of estimated annual ingot capacity and surplus amounted to $19.50 per ton.

Not only would the balance sheet structure be better, but there would be an actual improvement in earning statements, due to the elimination of insurance, local taxes and maintainance of the idle capacity abandoned. The partial elimination of the intangible threat of potential excess capacity probably would have a beneficial effect upon the keenness of competition and unintelligent price-cutting. Also, by continuing to write off the same actual amount for depreciation, there would be a larger amount available for the cash items of replacement on the remaining capacity.

While it seems evident that this general prescription is sound, the determination of the amount and the actual selection of the capacity to be abandoned, and the dissection of it from the remaining facilities of any single steel company, would require a great deal of careful study.

It will be noted that this suggestion does not imply the writing-down of the entire plant to present replacement costs, or the elimination of present inflation in the plant account, due to previous appraisals. Many steel companies have such inflation in their plant and equipment accounts, offset by capital surplus. A group of 11 steel companies, differing somewhat from those of Table II, with an aggregate ingot capacity in 1931 of 16,080,000 annual tons, had aggregate net plant and equipment of $41.80, capital surplus of $8.06 and earned surplus of $5.00 per annual ton of ingot capacity.

While the writing-down of this inflation and the bringing of the entire plant account down to present replacement costs would further improve the balance sheet structure and the operating relationships, these steps probably would not effect any actual decrease in the fixed property expense burdens of local taxes, insurance and maintainance.

The reasons why this condition has arisen are important in that the understanding of them may prevent a similar situation arising in the future. It seems impossible to escape the conclusion that this situation has been brought about by setting aside each year too small an amount to provide for the actual decrease in the value of the plants, due to the functional factor of obsolescence as well as for physical wear and tear, so that they might render the most effective continuous service to the consuming community.

Pass Burden Along in Price

The determination of how great a proportion of this burden any present generation should bear, is a difficult problem. The determination of who should bear it is even more so. In the past, the owners of our steel plants have borne a heavy burden for this purpose, when measured by their remaining profits, and their remaining profits have been at a lower rate than the average of representative industry. Even this burden for depreciation has seemed to be inadequate to assure the most effective continuous service to the consuming community. It is to the best interest of this consuming community that they should so be assured, and it would seem to be reasonable that an equitable portion of the expense of adequately renewing the assets required to render such service, should be passed along to them, as a fair element of price.

Just how such a fair addition to price is to be obtained and maintained is beyond the scope of this discussion. That it can be done, if the urgency of the need is apparent and if united, intelligent effort is put forth to do so, is assured by the past record of accomplishment by the steel industry. Until it is done, the steel industry will be unable to maintain the utmost effectiveness of its service to the nation, and the owners will not receive a "fair average return upon the assets required to render that service."

Decorate Bayonne Bridge

American Institute of Steel Construction, New York, on Dec. 3 unveiled plaques denoting that the Bayonne bridge of the Port of New York Authority was adjudged the most beautiful bridge of its class built last year. Miss Gloria Potter Iden, daughter of V. G. Iden, of the institute staff, unveiled the plaques, of stainless steel and made by the General Alloys Co., Boston. (See STEEL Oct. 3, page 30).

Construction and Enterprise

CONCISE, TIMELY BUSINESS BUILDING OPPORTUNITIES IN FIELD OF INDUSTRY

New England

GLASTONBURY, CONN.—Connecticut Light & Power Co., 30 Pearl street, will build an electric power substation to cost $18,000.

New York

BROOKLYN, N. Y.—Ajax Art Metal Products Corp. has been incorporated with $20,000 capital, by J. Frummer, 32 Court street, Brooklyn, N. Y.

BROOKLYN, N. Y.—American Screw Cap Corp. has been incorporated with 200 shares no par value by Attorneys Albany Service Co., 315 Broadway, New York.

BROOKLYN, N. Y.—Albee Metal Products has been incorporated with 100 shares no par value to manufacture metal radiator enclosures, by H. E. Goldberg, 535 Fifth venue, New York.

BUFFALO—Alhar Welding & Engineering Corp. has been incorporated with $20,000 capital to manufacture metal products, principally by welding.

LAKEWOOD, N. Y.—Duplex Wrench Co. has been taken over by John E. Coe, Lakewood, who will operate it in the production of wrenches and other metal products. Production has been moved to the plant formerly occupied by the Sherman Metal Products Co.

NEW YORK—George Becker Bronze & Iron Works has been incorporated with $15,000 capital, by H. Schiller, 132 Nassau street, New York.

NEW YORK—Hilderbrand Mfg. Co. has been incorporated with 5000 capital to manufacture printing press heaters, by J. Voelz, 447 West Forty-eighth street, New York.

NEW YORK—Invention Development & Sales Corp. has been iencorporated with 200 shares no par value to conduct a machine shop and garage, by H. Ascher, 475 Fifth avenue, New York.

NEW YORK—Package Specialty Corp. has been incorporated with $10,000 capital to manufacture sealing machines, by H. Hirtler, 148 West Twenty-third street, New York.

NEW YORK—Marimac Novelty Co. has been incorporated with $20,000 capital to manufacture metal products, by J. Gans, 32 Broadway, New York.

NEW YORK—Eastern Blade & Razor Corp. has been incorporated to manufacture razors and razor blades, by O'Brien, Bordman, Comboy, Memhard & Early, 60 East Forty-second street, New York.

New Jersey

CAMDEN, N. J.—International Pulverizing Corp. has been incorporated with 2500 shares no par value to deal in metals, by A. M. Stackhouse, Broadway and Cooper streets, Camden, N. J.

GARWOOD, N. J.—Liquidation sale of the equipment and machinery of the Aeolian Co., at Garwood, Dec. 15 and 16, will include power punch presses, tappers, shears, power hack saws, automatic screw machines, lathes, drill and arbor presses, milling machines, grinders, filing machines, shapers, air compressors and 250 electric motors from ½ to 40 horsepower. Samuel T. Freeman & Co. are auctioneers.

HARRISON, N. J.—Nopco Laboratories Inc. has been incorporated with $50,000 capital to deal in iron and other metals by W. I. Brunyate, 605 Broad street, Newark, N. J.

UNION CITY, N. J.—Kahle Engineering Corp. has been incorporated with $20,000 capital to manufacture engines and boilers, by Samuel S. Goodman, 401 Broadway, New York.

Pennsylvania

CATAWISSA, PA.—Central Forgings Co. is repairing and rebuilding its plant at a cost of $50,000.

NATRONA, PA.—Charles E. Miller, engineer Harrison township, 41 Chestnut street, Natrona, Pa., will receive bids until Dec. 8 for furnishing f.o.b. cars at Tarentum, Pa., one 500-gallons per minute vertical non-clogging sewage pump, motor, pipes, valves, fittings and electric equipment.

Ohio

AKRON, O.—Palmer Match Co., Corey avenue, has postponed construction of its proposed addition until after the first of the year. Hannah & Sterling, Grant building, Pittsburgh, are architects.

CLEVELAND—Airvia Products Inc., 1019 Williamson building, Cleveland, and 205 Richardson building, Toledo, O., has been formed to manufacture a window ventilator developed by the Owens-Illinois Glass Co., Toledo, for home, office and industrial use. S. B. Wood is president and treasurer, with headquarters at the Toledo office.

Michigan

ADRIAN, MICH.—Peerless Wire & Fence Co. is building an addition to its plant 60 x 248 feet for the manufacture of steel fence posts, which has been undertaken recently. The structure is planned for completion about the first of the year.

DETROIT—Nufore Parts Corp. has been incorporated with $10,000 capital to manufacture motor accessories and parts, by C. Frederick Stanton, 1274 Fourteenth street, Detroit.

ECORSE, MICH.—Murray Corp. of America, Clay avenue, Detroit, is having plans made for a 2-story boiler plant addition to its automobile body-building plant, to cost $35,000.

FERNDALE, MICH. — Progressive Tool & Cutter Co. has been incorporated with $10,000 capital to manufacture cutters, reamers and counterbores, by Frank J. Nefske, 2345 Wolcott street, Ferndale, Mich.

KALAMAZOO, MICH. — Kalamazoo Foundry Co. has been awarded the structural steel contract for a post-office building to be erected at South Haven, Mich.

MUSKEGON, MICH.—Austin Machinery Corp., 2969 Lake Shore drive, has been incorporated with 500 shares no par value to manufacture machinery, by W. E. Jeannot, 1691 Jefferson street, Muskegon, Mich.

SAGINAW, MICH.—Francis Engineering Co. has completed plans for a pumping station and supply reservoir for the village of Elk Rapids, Mich., to cost about $10,000.

Indiana

MISHAWAKA, IND.—Mishawaka Industrial Instrument Co. has been formed to manufacture pyrometers, according to announcement by the chamber of commerce.

Illinois

CHICAGO—Lectroline Co., 4121 South LaSalle street, has been incorporated with $100,000 capital to manufacture electrical specialties, by Arthur A. Berndt and associates.

CHICAGO—Bia-S-Troke Razor Corp., 180 West Washington street, has been incorporated with $10,000 capital to manufacture shaving needs and accessories, by Louis Ancel, 11 South LaSalle street, Chicago.

CHICAGO — Engineers' Specialty Co., 549 West Randolph street, has purchased the manufacturing rights to the Columbia one-way free-wheeling clutch formerly made by the Columbia Industrial Machinery Co.

CHICAGO—A. B. C. Oil Burner Sales & Service Corp., 120 North May street, has been incorporated to manufacture oil burners and accessories, by Samuel Spitzer, Forsythe building, Oak Park, Chicago.

CHICAGO—Chicago Automatic Vending Co., 111 North Leavitt street, has been incorporated with $5000 capital to manufacture automatic vending machines, by Robert C. O'Connell, 705 City Hall Square building, 139 North Clark street.

MOLINE, ILL.—Parr Instrument Co.,

222 Fifty-second street, has been incorporated with 4000 shares no par value to deal in machine shop and foundry products, by Harold L. Parr and associates. James M. Johnston, 310 Peoples Bank building, Moline, is correspondent.

WILMETTE, ILL.—Kroeschell Engineering Co., 827 Greenwood avenue, has been incorporated with $40,000 capital to conduct a general engineering business, by Gilbert A. and Paul H. Kroeschell. Butz, Von Ammon & Marx, 120 South LaSalle street, Chicago, are correspondents.

Southern States

WASHINGTON—Potomac Electric Power Co., Potomac Power Station, Washington, has let contract to the Babcock & Wilcox Co., New York, for two complete boiler units, each having capacity for 375,000 pounds of steam per hour, including superheaters, economizers, air heaters, desuperheaters and water-cooled slag-trap furnaces.

ALEXANDRIA, LA.—A. J. McCorkle, 822 Dalzell street, Shreveport, La., has been awarded a contract by the board of commissioners to build a pump house station equipped with electrically-driven pumps at Bayou Rapides culvert in Rapides parish. Equipment has been awarded to A. M. Lockett & Co., Queen & Crescent building, New Orleans.

BOGALUSA, LA.—Boiler house building for Bogalusa Paper Co. has been awarded to United Engineers & Constructors Inc., 112 North Broadway, Philadelphia, Pa. Ingalls Iron Works, Birmingham, Ala., will furnish the steel.

NEW ORLEANS — Imperial Auto Shop Inc. has been incorporated with 1000 shares no par value to operate an automobile repair business, by Edward McClintock, president.

SHREVEPORT, LA.—Shreveport Engineering Co. has been organized to manufacture mechanical fans, blowers and similar devices. A plant has been leased and equipment bought.

BALTIMORE — Biltwell Tank & Welding Corp., 910 West Pratt street, has been organized by Louis C. Loftus and associates to manufacture steel tanks and similar products.

Missouri

JOPLIN, MO.—John Brown Boiler & Metal Products Co., Joplin, has been organized by W. F. Gill, Webb City, Mo., and J. W. McMillan, Joplin, to manufacture a patented boiler and other products.

MAPLEWOOD, MO.—City council is considering a proposal to build and operate a municipal electric light and power plant, to cost $500,000.

ST. LOUIS—Jasper Blackburn Products Corp. has been incorporated to manufacture electric supplies and equipment, by J. Blackburn, president.

ST. LOUIS—Beck Engineering Combustion Co., V. S. Beck manager, manufacturer of gas burners, has added 5000 square feet of manufacturing space to its plant to accommodate increased demand for its products.

ST. LOUIS—Curtiss-Wright Airplane Co., W. S. Damon president, has employed 90 additional men to speed up production on 17 carloads of planes for Turkey and South America. An order recently was booked for 11 mail transport planes of 15 passenger capacity for American air lines.

UNIVERSITY CITY, MO.—William A. Riley Construction Co. has been allotted $51,685 by the quartermaster general's department for building a noncommissioned officers' quarters at Jefferson Barracks, St. Louis.

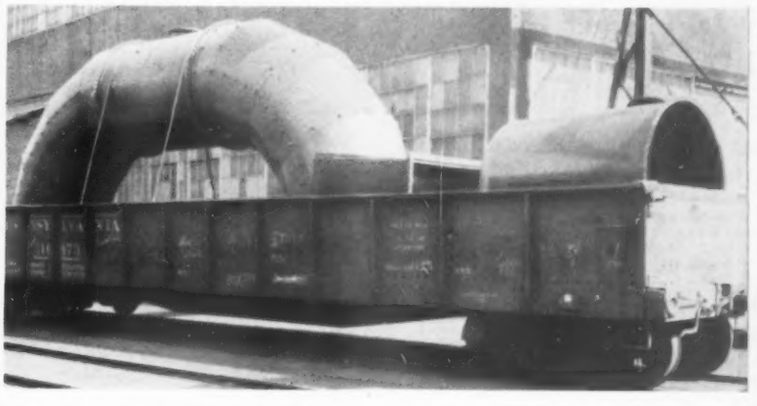
Arkansas

CONWAY, ARK.—City is taking bids for power plant equipment, including a 750-horsepower diesel engine unit, to cost $40,000.

JONESBORO, ARK.—City plans con-

GRAVER

TANKS and STEEL PLATE



The GRAVER Organization has unexcelled facilities for manufacturing and fabricating tanks and steel plate up to 2 in. thick, nickel clad steel, stainless steel, aluminum and other special alloys.

Our engineering department will cooperate with you in any degree desired, designing equipment completely to your needs or building it exactly to your specifications and specializing in welded construction.

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GRAVER TANK & MFG. CORP.
EAST CHICAGO, Indiana
Manufacturers and Erectors—Special Steel Plate Construction—Water Conditioning Equipment

Nearly 75 Years in Steel Plate Fabrication

struction of airport hangars and repair shop on a site recently acquired.

Oklahoma

OKLAHOMA CITY, OKLA.—Cervex Metal Weatherstrip Co. has been incorporated with $10,000 capital, by L. A. Macklanburg, 601 East Eighteenth street.

OKLAHOMA CITY, OKLA.—Macklanburg Brass & Copper Products Inc. has been incorporated with $10,000 capital, by R. A. Macklanburg, 1127 East Park street.

OKLAHOMA CITY, OKLA.—Winkler-Koch Engineering Co., Oklahoma City, Okla., has been awarded a contract by the Anderson-Prichard Oil Corp. for the construction of a 1500-barrel distillation unit at its Cyril, Okla., unit.

PONCA CITY, OKLA.—Stevenson Brass Foundry & Machine Works has been established at 112 North Union street, by J. W. Stevenson, owner.

PONCA CITY, OKLA.—Murtz Machine Works has opened a new shop at 208 East Second street. Roy Murtz is owner and manager.

Texas

DALLAS, TEX.—Southern Boiler & Machinery Co. has been incorporated with $4000 capital by P. N. Walton, president and general manager.

FORT WORTH, TEX.—Wonder Hoe Co. has been incorporated with $1000 capital to manufacture agricultural devices, by Bailey P. Evans, 279 West Tenth street, Fort Worth, Tex.

FREEPORT, TEX.—Freeport Sulphur Co. will build a plant in Plaquemines parish, La., including a power plant and machine shop. A. L. Norton is president and general manager.

HOUSTON, TEX.—A. S. and J. A. Beeley have organized the Texas Pipe Bending Co. and have established a shop at 301 Frio street.

HOUSTON, TEX.—Southwestern Steel Drum Co. has been organized by R. M. Harris, 703 Carr street.

HOUSTON, TEX.—South Texas Machine & Mfg. Works has been established at 2605 Polk avenue, by A. C. Caldwell, manager.

TYLER, TEX.—Standard Tank Co. has been incorporated with $1000 capital by J. L. Eppler, president.

Wisconsin

FOND DU LAC, WIS.—Sanitary Refrigerator Co. has booked an order from the war department for 1004 refrigerators, costing $31,675.50, deliveries to be completed by Feb. 1.

HUDSON, WIS.—A special election on the question of building a municipal power plant carried the project and engineering advice is being sought by the common council. George Hosford is city clerk.

RICE LAKE, WIS.—John Peters has reopened the foundry of the Rice Lake Iron Works, closed for more than two years, and will do a general jobbing and repair busines.

Iowa

VILLISCA, IOWA—The city has voted to build and operate a municipal electric light and power plant, to cost $150,000.

New Mexico

HILLSBORO, N. MEX.—El Oro Mines Co. plans to build a 300-ton milling plant with 1000-horsepower diesel power plant, to cost $150,000. C. J. Hutchinson, Hillsboro, is manager.

Pacific Coast

OAKLAND, CALIF.—Lasco Brake Products Co., Twenty-sixth and Magnolia streets, is planning to spend $75,000 in plant improvements and equipment.

HOOD RIVER, OREG.—Voters have rejected the proposal for a municipal power plant.

PORTLAND, OREG.—Montag Furnace Co. has purchased the rights of Roberts Engineering Co., manufacturer of an oil burner, and will produce it in connection with its heating equipment line.

SALEM, OREG.—Oregon public utilities commission is considering applications of the Crater Lake Lumber Co. and Ewauna Box Co. to construct logging railroads across Lakeview highway near Klamath Falls, Oreg., to tap timber holdings.

MT. VERNON, WASH.—County engineer of Skagit county is preparing plans for a steel bridge across Swinomish slough, bids to be called for early in 1933 after war department approval is obtained.

PUGET SOUND, WASH.—Navy officials are asking bids on 300 feet of welded cable, turbine pump and miscellaneous lots of steel bars.

SEATTLE—Shannon Engineering Co., Henry building, has been formed by W. D. Shannon, construction engineer, and four former Stone & Webster engineers.

WAITSBURG, WASH.—Waitsburg Welding shop is constructing an addition 20 x 100 feet to its plant here.

Dominion of Canada

VICTORIA, B. C.—West Kootenay Power & Light Co. has bought from the government 170 acres at Adams River, B. C., as a site for a hydroelectric power plant.

HALIFAX, N. S.—Sun Oil Co. Ltd., Montreal, Que., is in charge of construction of a large storage plant on North Burroughs street for Provincial Oils Ltd. Three tanks will be erected, with capacity of 522,000 barrels.

CROWLAND, ONT.—Gibson Lumber Co. plans to rebuild and re-equip its lumber mill, fire loss on which was about $30,000.

TORONTO, ONT. — Ontario Hydro commission will build an office building costing $1,750,000 at University avenue and Orde street, under direction of C. Alfred Maguire, commissioner, Toronto, Ont.

TORONTO, ONT.—W. Gordon Steel Works Ltd., King street, East Toronto, Ont., has been given the contract for steel tanks for a $25,000 gasoline refinery at Danforth and Warden avenues for Scarborough Refiners Ltd., 1505 Concourse building, Toronto, Ont.

TORONTO, ONT.—Arrow Conduit & Fittings Corp., Brooklyn, N. Y., and A. L. Wynston Jr., president of A. L. Wynston Jr. Ltd., Toronto, have formed a Canadian company, Arrow Fittings & Cable Co. Ltd., to manufacture products of the former company for Canadian use, at 72 Bathurst street, Toronto.

MONTREAL, QUE. — Contracts for construction of a $2,500,000 bridge over the St. Lawrence river near Montreal have been awarded, the Dominion Bridge Co. being given the superstructure at $778,243. Completion is set for May 1, 1935.

THREE RIVERS, QUE.—Common council is considering making improvements in the waterworks system at an estimated cost of $1,000,000. Z. Lambert is city engineer.

New Trade Publications

TURBO-BLOWERS — Allis-Chalmers Mfg. Co., Milwaukee, in bulletin No. 1908 describes its single-stage turboblowers, one of the new lines acquired through purchase of part of the line of the American Brown Boveri Co. They are adapted to blowing foundry converters, copper converters and for air blast for oil-fired furnaces.

ROCK DRILLS AND SHARPENERS —Ingersoll-Rand Co., New York, has issued a condensed catalog of its rock drills and sharpeners, putting into one volume much information concerning its equipment for drilling rock and reconditioning drill steels. Instructions are included for heat treating drill steels. The catalog is form No. 4101.

INDUSTRIAL LIGHTING—Catalog No. 219-A by the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., covers its industrial lighting equipment. Each unit is described plainly and the listing makes it easy to find them. Circular No. 1958 by this company is devoted to its De-Ion grid oil circuit breakers, for indoor service in voltages from 15,000 to 34,500 and interrupting capacities 500,000 to 2,500,000 kilovolt-amperes. Photographs and drawings supplement the text. Circular No. 1771-B covers several types of oil circuit breakers especially suited to indoor powerhouse installation where space is restricted. A single round tank serves for all poles.